



REGISTERED AS A NEWSPAPER

TELEPHONE: CENTRAL 3617
TELEGRAMS: "CHEMICUS,
CANNON, LONDON" (2 Words)

PUBLISHED WEEKLY AT 42 CANNON ST., LONDON, E.C.4.

SUBSCRIPTION WITH
DIARY 20/- PER ANNUM
SINGLE COPIES 9d.

No. 2479.

AUGUST 13, 1927.

Vol. CVII.



THE BEST HOUSE FOR ALL PHARMACEUTICAL PRODUCTS

Proprietors of the "Silver Churn" Dairy Preparations.

OLDFIELD, PATTINSON & Co.
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PHONES: City 984 & 4038. **MANCHESTER**

New Sizes

Allenburys'
Milk Foods
Nos. 1 and 2

Per **7/6** Tin

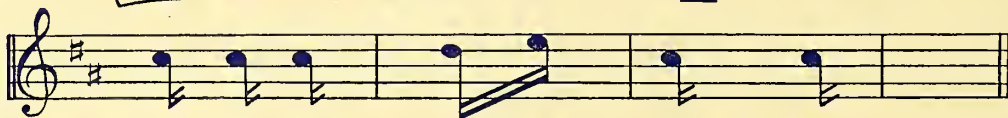


Per **7/6** Tin

ALLEN & HANBURY'S Ltd.

Bethnal Green, London, E. 2

LET'S ALL GO TO MR'S HOUSE~



AND GET OUR GOODS ON TIME!



MAY, ROBERTS & CO., LTD.,

7-13, CLERKENWELL ROAD, E.C.1.

P. O. BOX 157

Also at DUBLIN, LIVERPOOL and PLYMOUTH.

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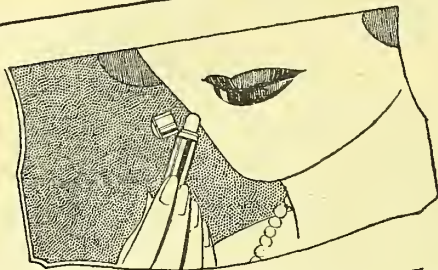


The holiday months of August and September are ENO months. Attractive ENO displays can be booked for any time during these two months to suit your convenience. They pay, and pay well, as is evidenced by one pharmacist who informed us recently that he "cleared a large size parcel in record time."

Write to the
Sales Manager, J. C. ENO Ltd., P.O. Box 671,
London, E.C.4.

A A

A new and unrivalled



Put the Bloom of Youth on them

There is the very magic of youth itself in Khasana, for it gives you just the colour that Nature meant you to have, instead of the crude pillar-box red that stamps itself at once as artificial. Orange in its container, it becomes, on blonde or brunette, the natural tint, a delicate flush or deep wild rose loveliness, as required. Once on, Khasana stays on. Only soap and water will remove it. No more stained cigarettes nor handkerchiefs. Khasana is rainproof, water-proof, kiss-proof. No one but you will know it from Nature's own gift. Next time you go to your chemist or hairdresser, buy Beauty, the new charm—

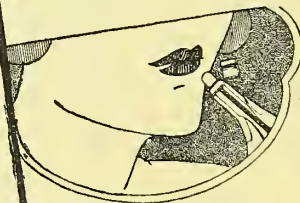
KHASANA SUPERB



Lipstick 1/6 & 2/6
Cream Rouge - 1/6

Khasana Limited,
13 1/2 Bunhill Row,
London.

Perfume, 2/- to 10/6; Powder, 1/6 to 2/6; Compact, 1/6; Day and Night Cream, 7½d. & 1/-

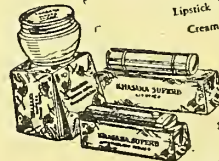


Put the Bloom of Youth on them

There is the very magic of youth itself in Khasana, for it gives you just the colour that Nature meant you to have, instead of the crude pillar-box red that stamps itself at once as artificial. Orange in its container, it becomes, on blonde or brunette, the natural tint, a delicate flush or deep wild rose loveliness, as required. Once on, Khasana stays on. Only soap and water will remove it. No more stained cigarettes nor handkerchiefs. Khasana is rainproof, water-proof, kiss-proof. No one but you will know it from Nature's own gift. Next time you go to your chemist or hairdresser, buy Beauty, the new charm—

KHASANA SUPERB

Lipstick 1/6 & 2/6
Cream Rouge 1/6



Khasana Ltd.,
131/2 Bunhill Row,
LONDON.

Perfume, 2/- to 10/6; Powder, 1/6 to 2/6; Compact, 1/6; Day and Night Cream, 7½d. to 1/-

line of Beauty Products

KHASANA SUPERB

LIPSTICK · ROUGE CREAM · POWDER

at prices that compel sales!

Never will you have handled so fast selling a line as Khasana Superb. Each article in the line is the very finest of its kind, yet the prices are far below others of competitive quality.

Khasana Lip-Stick and Rouge are the very latest type—orange in colour, changing on application to the skin into the exactly right shade demanded by each complexion.

A big national advertising campaign in the "Daily Mirror," "Daily Sketch" and the most important women's journals will spread the news of this revolutionary departure in marketing women's toilet aids at reasonable prices.

Note Your Profit

2780 Khasana Superb Lipstick
(in Metal Case)
11/- per doz. to retail at 1/6 each.

2782 Khasana Cream Rouge
11/- per doz. to retail at 1/6 each.

3 doz. at 11/- per doz. cost £1 13 0

$\frac{1}{4}$ doz. Bonus.

Cash discount $2\frac{1}{2}$ per cent. 10

£1 12 2

$3\frac{1}{4}$ doz. at 1/6 each sell for £2 18 6

$3\frac{1}{4}$ doz. cost ... 1 12 2

Profit £1 6 4

Namely:—£1 6s. 4d. profit on an outlay of £1 12s. 2d.

Profit on selling price 45·01 per cent.

" " cost " 81·86 " "

£ £ £

2781 Khasana Superb Lipstick (large size)
engraved gilt metal case with hinged lid, 18/- per doz. to retail at 2/6 each.

3 doz. at 18/- cost ... £2 14 0

$\frac{1}{4}$ doz. Bonus.

Cash discount $2\frac{1}{2}$ per cent. 1 4

£2 12 8

$3\frac{1}{4}$ doz. at 2/6 each sell for £4 17 6

$3\frac{1}{4}$ doz. cost ... 2 12 8

Profit £2 4 10

Namely:—£2 4s. 10d. profit on an outlay of £2 12s. 8d.

Profit on selling price 45·98 per cent.

" " cost " 85·12 " "

One of each free for demonstration with first order.

SHOWCARD. CARRIAGE PAID.

ORDER NOW — THE CAMPAIGN STARTS AUG. 18th.

KHASANA LTD.

131/2, BUNHILL ROW, LONDON, E.C.1.



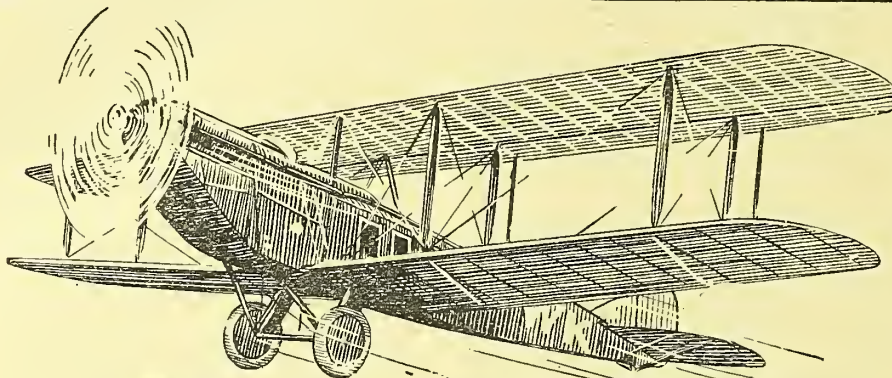
LUTON[®] STRAW HAT DYES

The outcome of 45 years' accumulated experience in the manufacture of household dyes. This series comprises all colours and is in demand practically all the year round. They are all highly efficient dyes and appeal to every woman on economical as well as fashionable grounds. Supplied in dull or glossy series.

AUROLAL[®] COLD WATER DYES

Just the thing for
Summer Frocks
and
Dainty Linen.

Good trade should be done in this line now by recommending it for this purpose to your customers. Recognised as the finest cold water dyes in the world for delicate and costly fabrics. Good results obtained even at the first trial. A certain seller.



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HAND in hand with acquired knowledge and the willingness to profit by the experience of the past Progress is ever dependent upon the ability to appreciate the needs of To-day, and indeed to anticipate those of the Future.

It is this constant stocktaking of our methods—the alertness swiftly to interpret the trend of Public Demand and the ability as swiftly to serve it that has earned for the House of Whitaker a reputation

second to none in the business of manufacturing Dyes.

And it is this keen appreciation of the Public call for new colours and, above all, colours which are true—fast—and in every way reliable, which is responsible for the unique popularity of **LUTON STRAW HAT DYES—AUROLAL COLD WATER DYES** and the other Whitaker Products, and maintains under all circumstances their accepted high standard of quality.

AUROLAL COUNTER CABINET FREE!

On Request with orders for 1 gross Assorted 'Auroral' Cold Water Dyes—the Trade Price for which is £2 8 0 and less 5% Discount if prompt cash payment is made. The Retail value of these Dyes is £3 12 0, so that the transaction shows more than 33½% net profit, or more than 50% on the turnover. Only one Cabinet (which is of a lasting and permanent nature) can be supplied to each customer. The dimensions of the Cabinet are—height of front 15½ ins., width of front 11¼ ins., breadth at top 5½ ins., breadth at bottom 10 ins. Send us your order To-night, and the Cabinet with your stock of 'Auroral' Dyes will be sent immediately.

A chemist writes:—"Thanks for sending on Cabinet. It looks very handsome on the counter."
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W.1.

Telephone: Regent 3825.

LUTON[®] HOT-WATER FABRIC DYES

The best hot-water dyes for all materials, giving perfect results with the minimum of trouble. As with all other Whitaker products, they show a good profit.

VELT[®] THE NEW CLEANER

A cleaning preparation for removing stains, grease, dirt, etc., from clothing, upholstery, curtains, etc., and renovating them. VELT is a non-inflammable liquid and is supplied in screw tins of which three dozens are contained in an attractive outer. A new Whitaker product, but nevertheless one which is already selling well. It is now available in 5-oz., 10-oz., and 20-oz. tins for the convenience of bigger users.

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TRAGACANTH



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BOON
AT ALL TIMES.



A NECESSITY DURING SUMMER MONTHS

RIBBON OF BRUGES

THE PERFECT SWEET FUMIGANT.

During combustion it diffuses a Prophylactic and Agreeable Vapour which, by combination, neutralises any mal-odour and kills infectious germs. In flats and small houses where the smell arising from culinary operations is too apparent, a few minutes' fumigation with Ribbon of Bruges will entirely neutralise all undesired odours.

RETAILS AT **1/-** PER BOX.

Mail a P.C. for Sample.

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guarantees that count

SUPERLATIVE EXCELLENCE, STABILITY & PURITY

*'Specialty'***CHEMICAL
FOOD**

PROFITABLE repeat business and satisfaction is ensured when you specialise in "Specialty" Chemical Food.

It is prepared from an original tested formula, and is of a rich brilliant colour and delicious fruity flavour. Guaranteed to be a pure phosphate syrup made from pure cane sugar and free from excess of acidity and the inky flavour usually associated with ordinary Chemical Food.

"Specialty" Chemical Food is supplied either in bulk or packed in various styles. It will pay you to send for samples and prices.

**ANGLO-AMERICAN OIL COMPANY, LTD.****"SPECIALTY" DEPT.**

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D.A.

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WILLIAM C. SLATER, Managing Director.

4 CARLISLE AVENUE, FENCHURCH STREET, LONDON, E.C.3

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A few of our latest Creations :—

AMBREINE

A sweet Oriental perfume with a delightfully delicate floral nuance.

LILY-OF-THE-VALLEY

True to Nature; even in its last traces on evaporation.

VICTORIA VIOLET

A very successful composition; a necessity to the creative perfumer.

PARMA VIOLET

A standard Violet; indispensable in the absence of the natural flower oil.

WALLFLOWER

A beautiful reproduction of the Old English Wallflower.

ROSE

An excellent substitute for Bulgarian Otto.

JASMIN

A composition giving the pungency as well as the ever-popular floralcy of Jasmin flowers.



Of the highest possible concentration, and hence very economical in use; perfectly soluble; do not discolour. Suitable for handkerchiefs, perfumes, face powders, vanishing creams, brilliantines, toilet waters, bath salts, soaps. Samples cheerfully sent by return of post.

DAGGETT & RAMSDELL'S

PERFECT

COLD CREAM AND VANISHING CREAM



The prices are—

PERFECT COLD CREAM.

6d. tubes	..	..	..	..	3/4 dozen
1/1 ..	..	..	..	..	8/4 ..
2/6 ..	..	..	..	..	18/9 ..
1/8 jars	..	..	..	..	12/9 ..
2/6 ..	..	..	..	..	18/9 ..
4/3 ..	..	..	..	..	34/- ..
7/- ..	..	..	..	..	56/- ..

PERFECT VANISHING CREAM.

6d. tubes	..	..	..	..	3/4 dozen
1/1 ..	..	..	..	..	8/4 ..
1/8 jars	..	..	..	..	12/9 ..
2/6 ..	..	..	..	..	18/9 ..

From all Wholesalers or direct from

BROOKS & Warburton

(American Drug Supply Co.), Ltd.,

40-42 Lexington St., London, W.1

ESSENCES FRUIT AND ARTIFICIAL

Inquiries are specially invited for the following:—

VANILLA from Selected Beans.

VANILLA from Vanillin.

PEPPERMINT—B.P. Oil.

PINEAPPLE—Artificial.

RASPBERRY—Fruit and Artificial

E. H. BUTLER & SON MANUFACTURING CHEMISTS
Humberstone Gate - - LEICESTER

Assist British industry by recommending the 'WATTS' Sheffield-made Safety Razor Blade, the blade of super-keenness.

A counter display will help.



A user writes: "Can't understand people buying foreign blades when such as yours are obtainable."

12 Perfect Blades in Every Dozen

For Gillette-type and Autostrap-type holders

3/6

per doz. allowing 50% PROFIT on cost for the dealer.

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Established over 150 years.

COTY

PRICE MAINTENANCE

Following the great success of the "Special Inauguration Offer," Coty wishes to assure the trade that there is and will be *no alteration* in the prices of Coty Face Powder, Compacte, or Refills. The campaign has created a tremendous demand for these numbers, and in particular for the Refills.

The subsequent national advertising now running is continuing this demand and constantly increasing it—concentrating its force on these important Coty Products.

The three attractive show cards illustrated, shewing plainly the price maintenance, will be sent to all Dealers upon request. Display them in your windows and on your counters. They will bring you a large volume of new sales from this vast fresh demand for Coty Creations.



COTY (ENGLAND) LTD.

COTY HOUSE,

3 STRATFORD PLACE, LONDON, W.1.

Telephone: Mayfair 6351.

HOVENDEN'S TOILET SOAPS

REDUCED PRICES.

ASSORTED COLOURS AND
PERFUMES.

(Similar to illustration.)

Each Tablet weighing about
5½ Ounces.

BATH SOAP.

Splendid Value.



4/9 doz.

No. 4712a.
55/6 gross.



No. 4621.

Large size, 7/6 doz. ;

84/- gross.

Boxed in ½ dozens.



No. 4621a.

Small size, boxed in dozens (as illustration),
3/9 doz. 42/- gross.

TOILET SOAP.

TRIPLE MILLED.

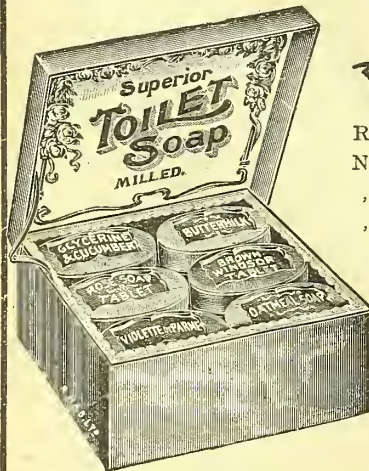
No. 4180 Series. Made in Windsor,
Rose, Buttermilk, Boracic, Oatmeal, &c.
No. 4180. Boxed 1 doz.'s 3/- 34/- gross

" 4180a. " 1 doz.'s 2/6 29/- "

" 4180b. " 1½ doz.'s 2/- 23/- "

VISITORS' SOAP.

Packed 3 dozen in boxes, 1/6 doz.
17/- gross.



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Telephone: MUSEUM 2810 (3 lines).

Maw's Page



Maw's for All Surgical Sundries

The House of Maw is wisely regarded by the majority of discriminating pharmacists as the premier house for the supply of the bread and butter, staple lines of the pharmacy. For surgical sundries, of course, the house is pre-eminent; its long experience and intimate association with the medical profession qualify it to produce goods of outstanding quality and reliability. Douches of all kinds are an example of the splendid quality and value represented in the surgical sundries produced by Maw's and every pharmacist will be well advised to order his douches from Maw's.

Maw's "Crystal" Douche

	Pints.	Per doz.
In white enamelled tin frame	1	38/-
ditto	2	40/-
ditto	3	45/-
ditto	4	50/-
In bronzed tin frame	2	30/-
ditto	3	33/-
ditto	4	36/-
Spare Glass Linings	1	18/-
	2	21/-
	3	24/-
	4	27/-

Steel Enamelled Douche

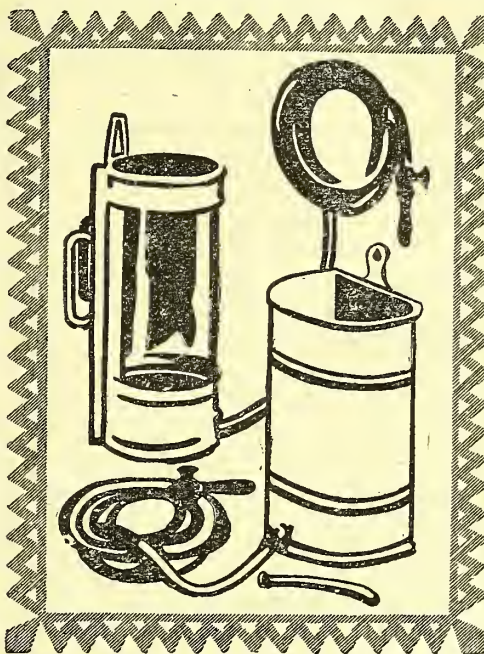
Without handle	1	33/-
ditto	2	36/-
ditto	3	39/-
ditto	4	46/-

Enamelled White

Ordinary quality, Maw's		
"Family"	1	31/6
	2	34/6
	3	38/-
	4	42/-

Maw's "Meridian"

	2	24/-
	3	27/-
	4	30/-



All the above are fitted with 6 ft. of ordinary red tubing, vulcanite stopcock, vaginal and rectal pipes.

Extra for standard red tubing for any of the above, per dozen, 6/-.

Extra for best red tubing for any of the above, per dozen, 10/6.

S. Maw, Son & Sons, Ltd.,
Aldersgate St., London,
and Barnet.





FAIRY DYES

Mean Greater Turnover for You—and Absolute Satisfaction for Your Customers.

THERE is no more attractive line on the market to-day—there is no better seller—and no article has made larger strides in popular favour.

FAIRY DYES

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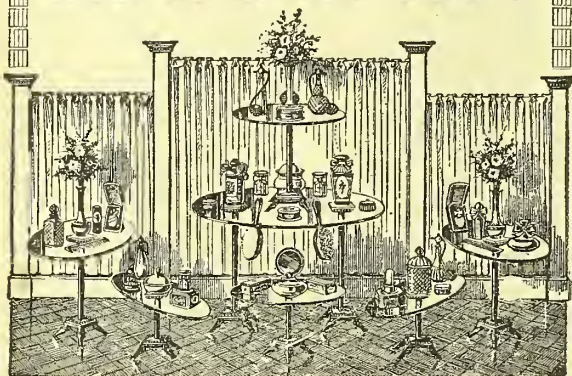
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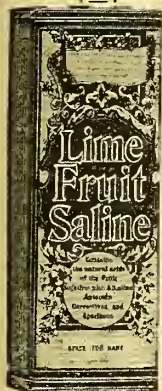


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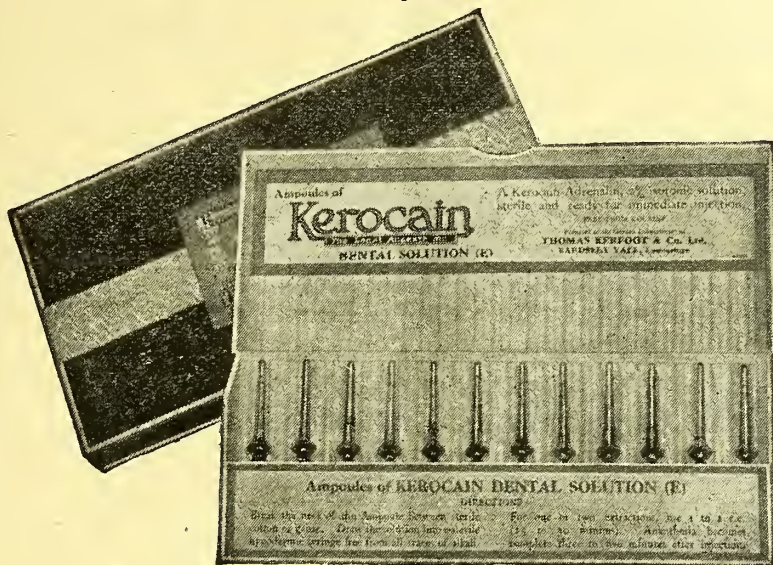
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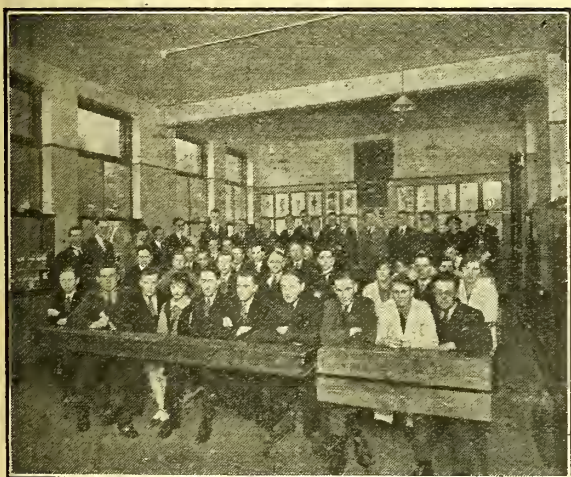
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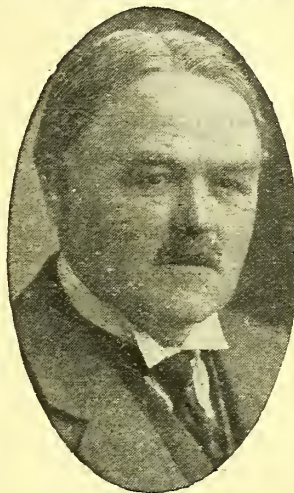
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THE SESSION COMMENCES IN OCTOBER.

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Fees, on application, from 30s. to 70s.
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All entry forms for the full-time day course must be received by 28th September. Registration nights for the part-time course on 26th, 27th, & 28th Sept., 6.30-9.

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The Technical College, Sunderland.

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SESSION 1927-1928.

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The classes are held on Tuesday afternoon and Wednesday afternoon and evening in the first year, and on Tuesday, Wednesday and Thursday afternoons in the second year. Students who have done the equivalent of the First Year elsewhere may be admitted direct to the Second Year Course.

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RICHARD MARTIN
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Head of the Pharmacy Department - H. BERRY, B.Sc., Ph.C.

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EXAMINATION.

C & D QUALIFYING
EXAMINATION.

PHARMACEUTICAL CHEMISTS
QUALIFYING EXAMINATION.

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Session 1927-28.

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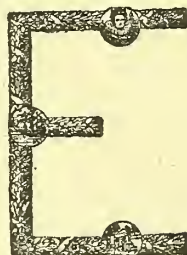
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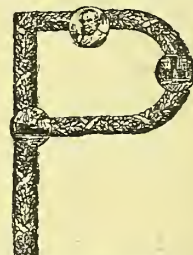
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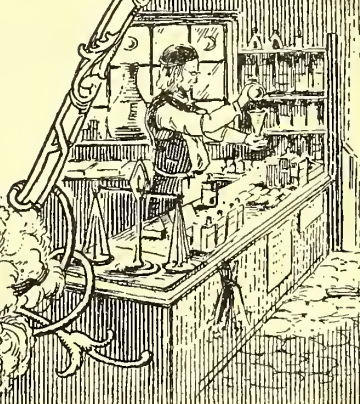
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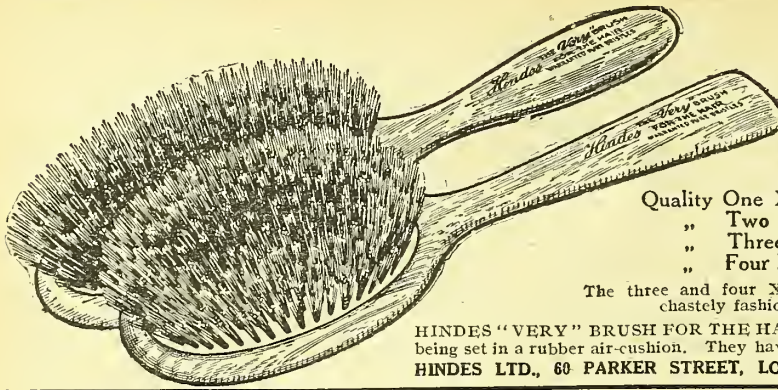
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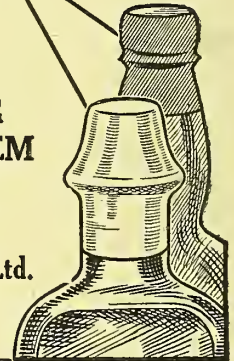
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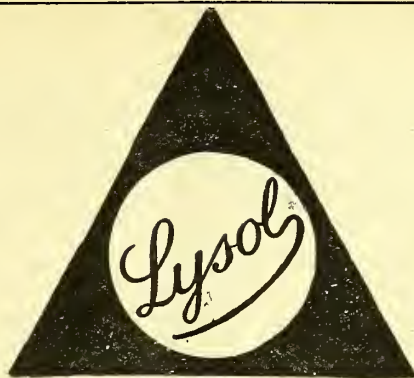
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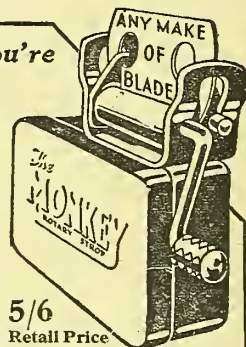
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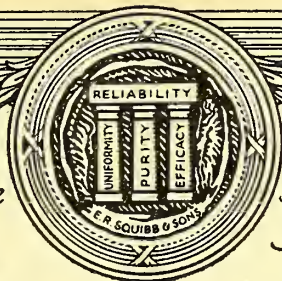
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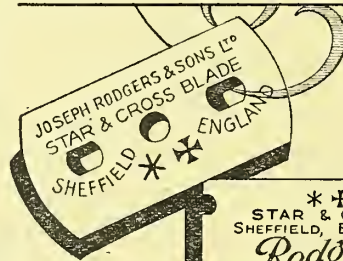
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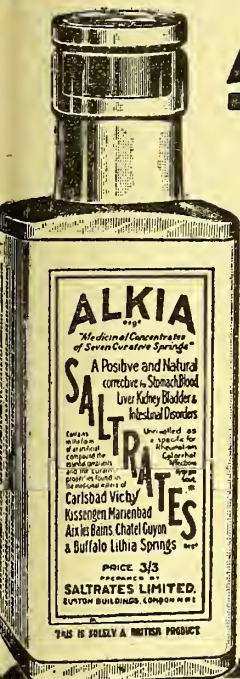
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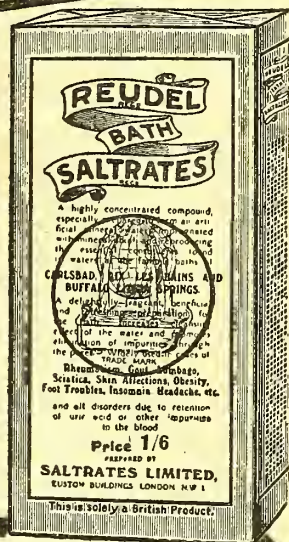
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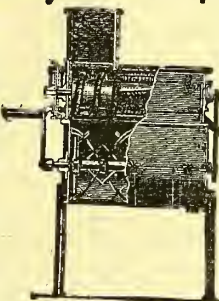
A Gardner "Rapid" sifter and mixer will thoroughly sift and mix $\frac{1}{2}$ oz. of one ingredient with a 30-lb. mixture of dry powders at one operation, and "every pinch of the whole will show its presence"—a customer's statement.

Write us for list of Ball Mills, Disintegrators, Millstones and Mills, Drum Sieves, Drying Machinery, etc.

WM. GARDNER & SONS
(Gloucester) LTD.

Bristol Road, GLOUCESTER.

'Phone 117. 'Grams: "Gardner," Gloucester



Time lost on Bottle cleaning

Users of bottles on a large scale will find it an advantage to use our methods. Enquiries invited.

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Speed with Quality.

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The EXTRA ACCOMMODATION at our NEW WORKS—

80/82 SEEL STREET, LIVERPOOL,

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FREE TRIAL—We shall be pleased to develop and print FREE one spool from any chemist enclosing this advertisement, or make a postcard enlargement free of charge from any negative.

CHEMISTS DOING THEIR OWN WORK are reminded that our service is at their disposal if we can help by:—

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THOMAS ILLINGWORTH & CO., LTD., Park Royal, Willesden Junction, N.W.10

New Designs in Pressure Filters.
Filling Machines for all liquids and sizes of bottles.



RAPID FILTERS

Latest designs for Rapid
Filtering of Essences,
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Absolute
brilliancy and
great speed.

**ASBESTOS FOR
FILTERING
2/- per lb.**

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Always**

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WE SPECIALISE IN PILLS AND TABLETS To Customer's Private Formulæ.

WE GUARANTEE ACCURACY
∴ AND QUICK DELIVERY ∴

Submit your Formulæ and ask for quotation, mentioning quantity. Our price is right, and the finish of our Pills and Tablets Second to None.

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Widely advertised to the Public.



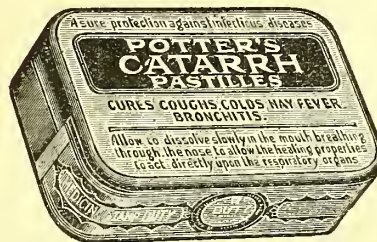
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P.A.T.A. 1/3

Per dozen - - 11/-

PURE ORANGE WINE

A. MILLAR & CO., LTD., DUBLIN

(VINUM AURANTII B.P.)

Prepared in strict accordance with the Formula of the British Pharmacopoeia.

(Wholesale only.)

Samples from Head Office, Thomas Street, DUBLIN, or London Office, 74 Great Tower Street, LONDON, E.C.3.

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10 & 11 MINCING LANE, LONDON, E.C.3.

GUMS, ARABIC and TRAGACANTH as Imported or
Finely Powdered. :: SHELLACS ALL GRADES.

EUCALYPTUS OIL, B.P.

water white,
triply distilled

1 gallon (approximately 9½ lbs.) 20/- cash with order.

SPECIAL OFFER AT COST PRICE
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Cloth Manufacture, Engineering, Physics, Mathematics,
Biology.COURSES FOR PHARMACEUTICAL
STUDENTS IN CHEMISTRY, BOTANY
and PHYSICS.

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CACHETS "FINOT"

(White or Coloured)

With inscriptions in any desired
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"A distinction all their own."—C. & D.

"Perfection of Cachets."—Lancel.

These Cachets are especially adapted for Headache, Neuralgia
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AMIDOL

PURE WHITE CRYSTALS
FREE FROM OXIDATION

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and they will instantly recover their
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GOOD SERVICE.We invite clients to inspect our
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themselves the system
under which we work.

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(Two minutes from Jubilee Clock.)

THE EFFECTIVE MOTHKILLER

destroys Moths & their
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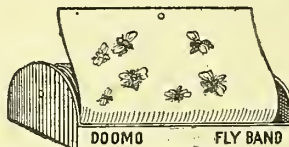
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LIBERAL TERMS

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'DOOMO' FLY BAND,
wide and long,
also narrower one.

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Doomo Works, NEWARK.

DUTCH DROPS

The Original HAARLEM OIL

Also in Capsule Form.

We are Sole Distributing Agents for the British Isles, British
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E.C.4

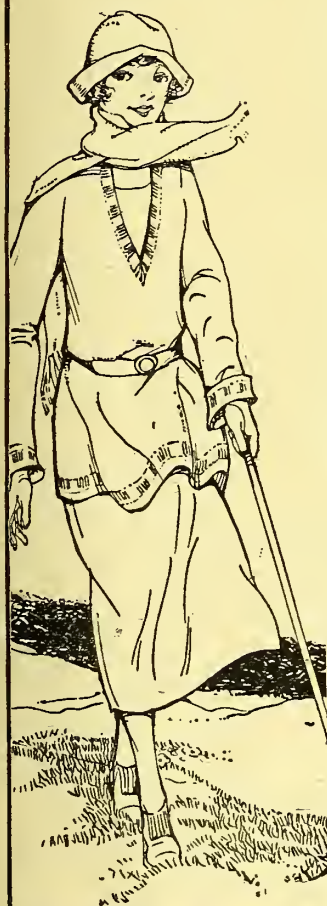


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toilet preparations. The
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"HAZELINE' SNOW"
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of profit year after year.
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Issued in aluminium
screw-capped glass pots,
each pot in a decorative
carton, at 15/- per doz.
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"HAZELINE'
SNOW"

FOR EVENING
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12 doz. at 5/- doz.

2 gross „ 54/- gross.

1/4 Size: 10/- doz.

3 doz. lots at 9/6 doz.

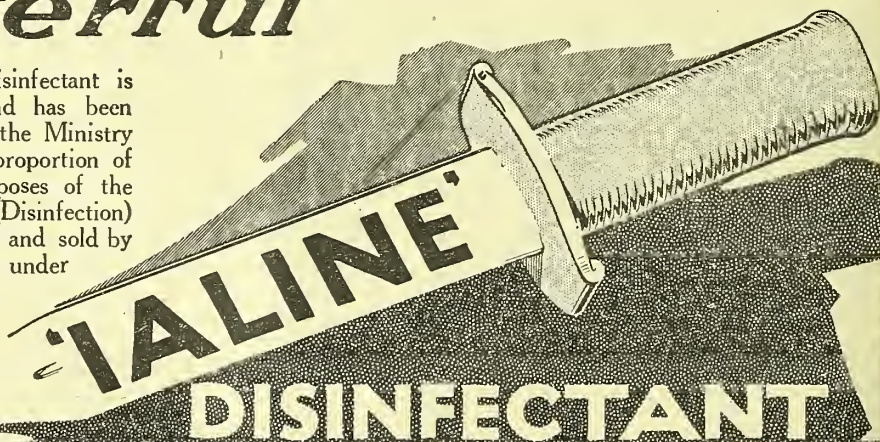
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UNITED CHEMISTS' ASSOCIATION LIMITED

Priority Court, CHELTENHAM ———— and 4/6 Keith Grove, Uxbridge Road, LONDON, W.12

Powerful

“IALINE” Brand Disinfectant is highly concentrated and has been officially approved by the Ministry of Agriculture in the proportion of 1 to 99 for the purposes of the Diseases of Animals (Disinfection) Acts. May be packed and sold by Chemists and Druggists under own name. Write for details of arrangement.



DISINFECTANT

—the strongest weapon against disease

Manufacturers—

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WORKS: Great Britain,
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Salisbury House, London Wall, LONDON, E.C.2.

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THE CHEMIST & DRUGGIST

Educational Number

AUGUST 13, 1927.

Published at Head Office: 42 CANNON STREET, LONDON, E.C.4.

Branch Offices: MANCHESTER; MELBOURNE & SYDNEY, AUSTRALIA.

Subscription: 20s. per annum to any part of the world. Single copies 9d. each.

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Series 2479

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English and Welsh News

The Editor will be obliged if subscribers will send him marked copies of newspapers containing items of interest for insertion in this or other news sections.

Public Health (Condensed Milk) Amendment Regulations, 1927

The Minister of Health has issued a draft of Regulations amending the Public Health (Condensed Milk) Regulations, 1923 (Stationery Office, 1d.). The principal feature of the proposed Regulations, which are to come into force in one respect on April 1, 1928, and in other respects on July 1, 1928, is the directions for printing the labels for the four kinds of condensed milk officially recognised; specimen wording is shown.

Medical Register

The following names have been restored to the Medical Register, from which they had been erased:—

Alexander, William N. (S)	Fourie, Louis (S)
Bullock, Arthur E., M.C. (S)	Mills, Everard A. (S)
Coventry, Charles	Power, Maurice A. (I)
Cullinan, Nicholas (S)	Yeates, Edward (I)

Society of Apothecaries of London

At the assistants' examination held on July 25-28 the following candidates were granted the certificate of qualification to act as an assistant to an apothecary in compounding and dispensing medicines:—

Ambler, B. M.	Franklin, E. V.	Moore, A.
Arthur, G. I.	Geldart, E. M.	Murley, A. M.
Aston, E. W.	Giles, E. F.	Ormerod, E. M.
Berry, D. S.	Golby, M. A.	Oxley, M. E.
Black, J. E.	Green, I. J.	Phillips, F. M.
Bossard, N. L.	Hallett, C. M.	Pidcock-Henzell, M.
Burton, M.	Hampshire, P. V.	Pooley, S. A.
Clarke, U. J.	Harris, E. F.	Powell, J. A.
Clifton, K. H.	Hasell, F. M.	Price, M. M. C.
Colbatzky, K. H.	Holt, B. J. A.	Rose, E. K.
Collins, E. V.	Horn, D. E.	Silver, R.
Crook, M. D.	Jackson, G. G.	Taylor, D.
Davenport, A. J.	James, D. M.	Taylor, N.
Dobson, G. H.	Jennings, F.	Thomas, V.
Elsworthy, U.	Keeble, R. L.	Thompson, E. H.
Evans, P. M. R.	Kendall, J. A.	Whettall, P. M.
Fenn, I.	Lawrence, M.	Wilkins, W. E.
Fosbery, E. N. P.	Mawer, E. R.	Williams, L. E. M.
Foster, L. W.	Miller, N. D.	Young, N.

Poisonings

At Shrewsbury, on August 8, an inquest on the body of Emma H. Ellis, boarding-house keeper, aged sixty, resulted in a verdict of "Death from vinegar poisoning." It was stated that the deceased had been fond of vinegar all her life, and that an empty bottle found by her side had contained two and a half pints of it.

At Folkestone, on August 8, an inquiry was held concerning the death of Adam E. Dinsdale, a War Office pensioner. A daughter gave evidence to the effect that her father sometimes emptied his bottle of sleeping mixture, which contained twenty-four doses, in two days. A medical witness deposed that the mixture contained paraldehyde and chloral hydrate, and that half the bottleful taken in twenty-four hours would not have been fatal. The *post-mortem* examination showed that death was due to an hypnotic: a "misadventure" verdict was returned by the jury.

C C

Merchandise Marks Act, 1926

THE Board of Trade has now decided that "shipping marks" on outside packages, composed of the name of a place in this country, accompanied by an identification mark (providing the identification mark is not the trade-mark or an abbreviation of the name of the U.K. firm) will not be considered an infringement of the Merchandise Marks Act. Packages bearing such shipping marks need not be marked with an indication of origin of the goods they contain, and the shipping mark need not be obliterated at the time of sale, wholesale, in this country:—

Example

A. Brown & Co., London, could use

B	or	XYZ
LONDON		LONDON

but they must not use

A.B.C.	or	A. B. & Co.
LONDON		LONDON

without giving an indication of origin of the goods in the packages (either "foreign" or made in —), as such marks bear on the name of the firm. One initial of a firm over the port of arrival is permitted, or a combination of letters other than those of the initials of the importing firm may be used, but not the full initials of such firm or their trade-mark. The above decision is the result of negotiations between the Board of Trade and the British Chemical and Dyestuffs Traders' Association, Ltd., and it has been published in Bulletin No. 55. It will be seen that it reverses the original decision given by the Board of Trade (*C. & D.*, June 11, p. 731).

The West London coroner concluded an inquest, on August 8, on the body of Mrs. V. E. Dey, Harrington Gardens, who was found dead on July 8. Dr. J. H. Ryffel stated in evidence that his analysis disclosed no trace of poisoning: in view of the length of time the body had been lying in the flat, this was not surprising. The coroner suggested that death was due to poisoning by dial, a substance sold freely in France, where the deceased had been, adding that she might have taken a normal dose, which in some cases proved fatal. He recorded an open verdict.

Liverpool

Many city chemists are making a seasonable feature of anti-ting lotions, while other displays include sea-sickness remedies and pick-me-ups.

In the return match with Chorley, on their ground at Wavertree, the tennis section of the Liverpool Pharmacy Club defeated the visitors by eight games to two.

Miscellaneous

THEFT OF CAMERAS.—A window at the premises of Bennett & Morris, Ltd., chemists, Catford, London, S.E., was broken on the morning of August 6 and some cameras were stolen.

ENGLISH HONEY.—A really good harvest of honey has not been secured in this country for years (says a "Times" correspondent), and beekeepers have every reason to fear that there will be an exceedingly poor return, especially of section honey, this year, owing to the cool and wet weather during the honey-flow.

SALE OF FOOD AND DRUGS ACTS.—At Staple Hill Police Court, recently, J. W. Kirk, Broad Street, was fined 5s., with 25s. costs, in respect of a sale of "malt vinegar" certified by Mr. R. H. Ellis, F.I.C., public analyst, to contain 32 per cent. of artificial vinegar and 20 per cent. of added water.

PORTRAITS AT KEW.—A collection of more than twenty portraits of distinguished botanists, with specimens of plants named after them, is being exhibited in Museum III of the Royal Botanic Gardens, Kew. Among the British celebrities whose portraits appear are Darwin, Sir Joseph Banks, Hales, Menzies and Cunningham; foreign botanists include Linnæus and de L'Obel.

A TRAVELLER'S SAMPLES.—At Otley Police Court, on August 5, John Wilfred Horner, commercial traveller, Stonegate Terrace, Leeds, was fined 10s., with costs, for selling two bottles of medicated wine without holding a licence. The bottles, it appeared, were samples supplied by defendant's employers so that prospective customers could taste the wine. The defendant's explanation was that he was financially embarrassed.

FIRES.—The pharmacy of Mr. H. V. Levin, chemist and druggist, Blackpool, was involved in an outbreak of fire which occurred in a flat above the shop on August 4. Though not touched by the flames, a quantity of the stock was damaged by water.—A fire, attributed to sulphur becoming overheated, broke out on August 9 at the works of John Riley & Sons, Ltd., acid and alkali manufacturers, Hapton, Burnley. Considerable damage was done before the outbreak was subdued.

IN THE COURTS.—At Goole, on August 3, Arthur Wilson, described as a chemist's assistant, was fined 12s. 6d. for aiding and abetting a lady to ride a motor-cycle without a licence.—At Dunster Police Court, on August 5, Frederick Ellis, chemist, The Parade, Minehead, was fined £10 for having been drunk while in charge of a motor-car.—At Leeds Police Court, on August 5, Hayden Croxen, Sheffield, was fined 10s. for employing a boy under fourteen years of age without having obtained a certificate that such employment would not be prejudicial to the boy's health or physical development, and Albert E. Greaves, Bradford, was fined 10s. for allowing his twelve-year-old son to be used in this way. Evidence showed that Croxen was seen in the Leeds open market selling a liquid which he described as a cure for various ailments. He poured some of the liquid into his hand, and the boy, on inhaling it, staggered. The medical officer of health for Leeds stated that the liquid contained formalin.

Scottish News

Brevities

Mr. P. V. Albrecht has been appointed representative in Scotland for Parfumeries de Paris, Ltd.

Mr. Anderson Nicol, M.A., son of Mr. George Nicol, chemist and druggist, Stevenston, is studying for the ministry of the Church of Scotland.

Dr. C. E. Douglas, Cupar, who is well known to Fife-shire chemists, received the honorary degree of LL.D. at Edinburgh recently, on the occasion of the visit of the British Medical Association.

The increased charges of dentists affecting members of friendly and approved societies has resulted in the formation of a company registered as the Scottish Insurance Dentists' Co., Ltd., and the establishment of clinics.

Edinburgh

Competitors for the Young photographic prize competition of the Edinburgh Chemists', Assistants' and Apprentices' Association must send in prints to Mr. Hamilton B. Young, Murray Place, Corstorphine, before September 30.

Irish News

Free State Patents and Trade Marks

As a result of the passing of the new Patents and Trade Marks Act in the Irish Free State, holders of British patents and trade marks desiring to retain protection in Southern Ireland, must take out fresh patents or trade marks there. British patents, granted before December 6, 1921, may continue on the Irish Register if a copy of the patent is lodged in Ireland and renewal fees are paid as in England. Similar privileges apply to registered trade marks and designs. Any application for a patent made without reference to earlier British patents must be accompanied by the report of a patent agent based upon a search for novelty in the British records.

Brevities

It is officially announced that the International Medical and Surgical Supply Co., Ltd., is being wound up voluntarily, and that Mr. J. Mackie, 39 and 41 Dame Street, Dublin, has been appointed liquidator.

Mr. John Thompson, Ph.C., compounder at Londonderry Dispensaries, has been granted leave of absence. His duties are being divided between Mr. W. G. Mitchell Ph.C., and Mr. S. Dale, Ph.C.

Belfast

Mr. T. W. McMullan, M.P. (Thomas McMullan & Co., wholesale druggists, Belfast), has been elected chairman of the Management Committee of the Belfast Art Union, which has been appointed by the Northern Ministry of Commerce to encourage the fine arts.

Although the second annual elections of the Pharmaceutical Council of Northern Ireland are not due to take place until the end of September, they are already arousing great interest. The pharmacists who retire this year by rotation are: Messrs. A. C. McBride, J.P. (Armagh), W. S. Taylor (Enniskillen), A. Wilson (Belfast), and R. I. Edwards (Belfast), while the druggists who retire are Mr. J. Moffet and Mr. S. Suffern. Since the last election Messrs. Moffet and Suffern have taken the modified pharmaceutical examination, and are, therefore, no longer eligible to stand as druggists' nominees. They are, however, eligible to stand as pharmacists' representatives, and, so far as is known, they intend to do so, but the drug trade candidates have not yet been selected. There are also rumours of independent candidates, a prominent name being Mr. H. F. Moore (Belfast), who, although unsuccessful, polled heavily last year. Of the retiring candidates, Mr. McBridge is vice-president of the Society, while Mr. Edwards was co-opted only two months ago to fill the vacancy created by the resignation of Mr. H. G. Pring.

Canadian Notes

CANADIAN CUSTOMS REGULATIONS.—The regulations and instructions relating to the prepayment of import duty on advertising matter by means of Customs stamps have been consolidated in a revised circular recently issued by the Customs Division of the Canadian Department of National Revenue. The text includes the following: Customs duty stamps, for the payment of import duties on advertising matter, price lists and catalogues, can be obtained in England from the Secretary, High Commissioner, The Canadian Building, Trafalgar Square, London, S.W.1, England. The duty stamps are to be affixed on each package for the amount of duty payable, and should be affixed in accordance with the postal regulations of the country of despatch. Packets bearing customs duty stamps on arrival at the frontier port in Canada are transferred to the customs, to be checked for proper payment of duty and to have the stamps cancelled. Duty on advertising matter may be prepaid by affixing customs stamps on the following scales: Under the British Preferential Tariff from 1c. to 10c. Under the Franco-Canadian Convention of 1922 from 1c. to 13c. Under the general tariff from U.S. from 1c. to 15c.

French News

From the "C. & D." Paris Correspondent.

THE THIRD EXHIBITION of "Arts de la Coiffure et de la Parfumerie" will be held this year in Paris, from October 14 to October 25.

M. ROSSET, Saint Mandé, who has incurred sixty-three contraventions for opening his pharmacy on Sundays, was finally condemned to one day's imprisonment. He drove to the court in a motor car decked with flowers and accompanied by two friends, M. Hocque, a leading "passive resister," and a local municipal councillor. The public prosecutor handed the pharmacist the necessary document and he continued his ride to the prison door, where he took leave of his companions for twenty-four hours.

PLANT NAMES.—The popular names for plants are often curious and original. M. Mahieu spoke at the last meeting of the Paris Society of Pharmacy on certain skin affections caused by the use of the root of the "herb of the woman who has been beaten" (*l'herbe à la femme battue*), sold by charlatans under the name of "vegetable pomade," and recommended by them as a liniment in cases of sciatica, etc. Some hospital doctors, who had had patients for skin diseases caused by its use, had sent him samples, and he had identified it as black bryony (*Tamix communis*). He proposed that its use should be legally prohibited.

THE Wholesale Druggists' Association, which has organised lectures on raw drugs, etc., for the benefit of the employees of their members, consulted recently with the Essential Oils Association and the Perfumery Association as to the desirability of throwing open the lectures to employees in the perfumery and kindred trades. A favourable decision was reached, and this implies the possibility of larger subscriptions towards the cost of the lectures as well as an extension of their scope and utility, which might justify aid from the State. The amount of the subscriptions towards the cost of these lectures contributed by firms is deducted when levying the "apprenticeship" tax claimed by the government.

MAXIMUM DOSES.—In order to assist his pupils in committing to memory the maximum dose of a given medication, Dr. Maurice Perrin, Professor of Therapeutics at the Nancy Faculty of Medicine, has drawn up a table of "codified doses"; i.e., the figures given by the Codex as the maximum dose per twenty-four hours for an adult. The following extracts will sufficiently explain his system: One milligram, atropine, crystallised digitaline, strophanthin; one centigram, veratrine; one gram, calomel, veronal, iodoform, digitalis, rue, sabine, squill in powder, etc. He thus reduces to some thirty paragraphs the posological scale, which the pharmacist is not legally allowed to exceed in dispensing without the express written instructions of the doctor.

Colonial and Foreign News

DEGREE IN PHARMACY AT WARSAW.—The degree of Doctor Pharmaciae of the University of Warsaw has recently been conferred, for the first time since the Faculty of Pharmacy was created two years ago.

AMBERGRIS FIND.—It is reported that a lump of ambergris weighing more than 28 lb. was found on July 19, fifteen miles off Cape May, New Jersey, by a fisherman. Mr. Pratt later said that he had been offered \$448 per lb. for his find by a New York perfumer.

PAPONICA.—This is the name of a papain preparation invented by a manufacturer in Ceylon. Samples sent to the Imperial Institute have elicited favourable comment. It is used in Ceylon in the preparation of cakes and confectionery instead of eggs. In a country which is essentially Buddhist and where a large proportion of the population are averse to eating flesh or animal matter, paponica is expected to find a large demand, but it will be several years before it will be produced in quantities large enough to induce the makers to offer it for sale in the local markets instead of exporting the entire output abroad where better prices are obtained.

NEW GUATEMALAN SOAP DUTIES.—A legislative decree, which becomes effective on September 8, establishes the following new rates of duty on soaps imported into Guatemala (rates in quetzals, for one kilo):—Ordinary soap containing resin, in any shape, for washing clothes and other similar purposes, also Sapolio, sand soap, argil soap, and coal-tar soap, for dogs, gross weight, 0.24; ordinary soap not containing resin, in bars, gross weight, 0.40; ordinary soap not containing resin, in cakes or pressed bars, not perfumed, gross weight, 0.60; soap for toilet purposes, in powder form, 1.14; soap of all kinds, for toilet purposes, perfumed, 1.50; medicinal soap of secret composition, or prepared according to special formula, 0.75.

A TURKESTAN PHARMACY.—In Khiwa a sorry impression is given by the one-storeyed, clay-built pharmacy which serves the needs of the 30,000 inhabitants of the town. The dispensary fixtures consist of three dilapidated cupboards and a table which stands on bare mother earth, while an adjoining room, a store for empty mineral-water bottles, contains a still and a washing apparatus serving equally for bottles and the garments of the staff of manager, three assistants and apprentices. Two small cupboards full of packets, bottles and other odds and ends, and a few roughly hewn wooden shelves, on which stand next to each other such medicaments as castor oil and carbolic acid, complete the fittings. Beguiled by tempting offers of the Ushek Pharmaceutical Society and promises which are never fulfilled, the newly engaged *confrère* who finds himself in this dismal hole is compelled to remain until further orders.

INDIAN TRADE IN DRUGS AND MEDICINES.—The imports of drugs and medicines into India (excluding chemicals and narcotics) during the year 1926-27 were valued at rs.206 lakhs against rs.183 in the previous year. The imports of camphor amounted to 1,400,000 lb. against 1,000,000 lb. in the previous year, more than half the quantity coming from Japan. The other imports included the following:—

	1925-26	1926-27
Cassia lignea	cwt. 50,000	79,000
Cocaine	oz. 1,334	551
Cod-liver oil	lb. 85,000	67,000
Morphine	oz. 687	1,090
Preparations of opium and morphine	rs.49,000	89,000
Proprietary and patent medicines	rs.24 lakhs	rs.27 lakhs
Quinine salts... ..	lb. 130,000	120,000

Drugs and medicines exported during the year were valued at rs.37 lakhs. The following are some of the particulars:—

	1925-26	1926-27
Cinchona bark	lb. 486,000	80,000
Nux vomica	cwt. 44,000	54,000
Senna	cwt. 45,000	49,000
Other drugs and medicines	rs.22 lakhs	rs.24 lakhs

Canadian Chemical Industries

THE chemical industry of Canada again showed substantial progress in 1926, according to a preliminary report published by the Dominion Bureau of Statistics. The total value of production was \$120,369,518, an increase of nearly \$7,500,000 over 1925, and the highest since 1920, when enhanced prices partially accounted for the high value of production at \$124,545,772. The magnitude of the business of manufacturing chemicals and allied products in Canada is indicated by the fact that 533 plants reported, and that these employed more than \$132,000,000 of capital, a figure almost six million dollars over 1925. There was considerable increase in employment from 13,951 persons in 1925 to 14,313 in 1926. Practically all branches showed gains in production, large increases being recorded in the following groups:—Paints, pigments and varnishes; acids, alkalis, salts and compressed gases; soaps, washing powders and toilet preparations; medicinal and pharmaceutical products, and in the miscellaneous chemical group.

MEDICINAL CHEMICALS, ETC.

There were 126 plants producing medicinal and pharmaceutical preparations in 1926, compared with 120 in the previous year. Production for the year was valued at \$15,145,641, against \$13,987,849 in 1925. Employees numbered 2,358, and their yearly earnings were \$2,842,662. Imports of medicinal, pharmaceutical preparations, and other drugs were valued at \$3,100,911, against \$2,968,089 in the preceding year. Among the principal materials used in quantity in the manufacture of medicinal chemicals was 180,000 proof gallons of ethyl alcohol, 18,000 lb. of crude iodine, 3,000 lb. of bismuth metal, 58,000 lb. of barium peroxide, 2,000 lb. of caffeine, 32,000 lb. silver bullion, etc. About \$6,000,000 worth of patent and proprietary medicines were produced, also toilet preparations valued at approximately \$900,000, and other products brought the total output value up to approximately \$14,000,000.

MISCELLANEOUS CHEMICALS

In addition to the industries reviewed there were 124 plants producing other chemical products of various kinds during 1926. The output of these factories was valued at \$11,592,356 from materials which cost \$5,461,224. More than 1,800 persons were employed. Adhesives, baking powder, boiler compounds, celluloid products, flavouring extracts, insecticides, polishes and dressing, sweeping compounds and other chemical products are included in this group.

ACIDS, ALKALIS, SALTS, ETC.

The production of industrial chemicals and gases was greater in 1926. The 43 plants in this industrial group employed a capital of \$38,186,893, furnished employment to 2,406 workers the year round, and converted \$13,210,800 worth of raw material into finished products valued at \$28,717,401, an advance of \$1,200,000 over the total value for 1925. Sulphuric, hydrochloric, nitric, and acetic acids, caustic soda, saltcake, calcium carbide, cyanamide, liquid chlorine, phosphorus, oxygen, carbon dioxide and acetylene were among the leading products. Industrial chemicals were made in 20 different plants, and compressed gases in 23 factories.

COAL TAR AND ITS PRODUCTS

There were eight tar-distilling units and seven plants manufacturing disinfectants in 1926, which gave employment to 190 people, and produced commodities valued at \$2,942,443, an increase of \$319,622 over the sales value of the 1925 output. Capital employed at \$4,208,697 represented an increase of one million dollars. The principal products were creosote oil and other special oils, pitch, refined tar, cresylic acid, disinfectants, etc.

WOOD DISTILLATES AND EXTRACTS

The production of wood distillates and extracts in 1926 amounted in value to \$1,734,993, against \$1,989,996 in 1925, a decline of 13 per cent. and the lowest output value on record for this industry. Only nine plants were in operation, capital employed was \$2,217,049, and the 225

workmen were paid \$214,694 in salaries and wages during the year. Exports of methanol during 1926 showed a decline of 37,196 gallons compared with 153,419 gallons in 1925 and 155,335 gallons in 1924. The effect of the German synthetic methanol has been serious to Canada's export trade, not alone in methanol, but to all products of the wood distillation industry.

INKS, DYES AND COLOURS

Printing inks, writing inks, dyes and dye soaps, printers' rollers, caramel, mortar colours, stains, mucilage and paste were the main products of this industry. In 1926 there were 26 plants in operation, and production was well maintained at \$2,800,871. Capital employed amounted to \$2,705,266, and the number of workers stood at 438. Seven plants made writing inks as the main product, 13 printing and lithographic inks and printers' rollers, and six dyes and colours.

SOAPS, WASHING COMPOUNDS AND TOILET PREPARATIONS

This industry also showed a substantial increase in production value during 1926. The sales value of output in that year were \$18,908,991, against \$17,388,506 in the preceding year. More than \$2,500,000 was paid to the 1,997 employees. Raw material cost \$10,910,278. Capital employed stood at \$17,021,000, against \$16,731,500 in 1925. Of the 38 concerns producing soaps chiefly, 22 were classed as makers of washing compounds and 40 as makers of toilet preparations. Imports of soap reached a value of \$1,199,893, and exports \$783,261.

ARSENIC PRODUCTION

Arsenic is produced as a by-product of the cobalt ores treated at the Deloro smelting and refining works at Deloro, Ontario. In 1925 the total Canadian production was 3,434,137 lb., against 4,621,567 lb in the preceding year. Arsenic is used mainly in the manufacture of calcium arsenate, the annual consumption of which depends on the activities of the boll weevil in the southern states of U.S.A. In 1925 producers of this insecticide looked for a large consumption in the following year. This anticipated consumption did not take place, with the result that the price of arsenic declined towards the end of the year. The exports to the United States from the Kingston district shows that the shipments of arsenic for the following periods have taken place:—

	Lb.	Value
1923	2,562,000	\$294,300
1924	2,753,300	\$239,100
1925	1,856,000	\$101,100
1926	3,046,500	\$99,000

Although the tonnage each year, with the exception of 1925, shows an increase, the values, on the other hand, have decreased. The Deloro Co. in recent years has established its own insecticide factory in the United States to cater for that market.

PETROLEUM

Official figures for the year ended March 31, 1927, show that Canada's imports of both crude petroleum and refined petroleum products are on the increase. For the year the imports of crude petroleum amounted to 588,368,000 Imperial gallons, valued at \$29,408,000, an increase of approximately \$6,000,000 in value. Imports of refined products for the same period were 106,114,000 gallons, valued at \$16,605,000, an increase of \$1,700,000 in value.

FERTILISERS

The production of manufactured fertilisers in 1926 amounted in value to \$1,516,685, a gain of \$100,000 over the output in 1925. Capital for the twelve plants in operation stood at \$1,818,743, employees numbered 214, and payments in salaries and wages amounted to \$483,000. This industry covers only those firms making complete fertilisers. Commodities such as cyanamide, ammonium sulphate, etc., are classified in other industries. Imports of fertiliser materials were valued at \$3,692,680, and exports at \$4,664,316.

IMPORTS

Imports of chemicals into Canada during 1926 showed a substantial increase over 1925, while exports were con-

siderably lower. Total imports of chemical and allied products were valued at \$31,358,384, compared with \$27,653,819 in 1925. Important gains were recorded for fertilisers, paints and inorganic chemicals, while nearly all other classes showed small gains. Of the total imports, 64 per cent. came from the United States, 16 per cent. from the United Kingdom, and 20 per cent. from other countries, chief among which were Germany, France, the Netherlands, Chile, Argentina, Belgium and Switzerland.

EXPORTS

Exports were valued at \$16,308,773, against \$17,490,254 in 1925. Cyanimides, calcium carbide, sodium, cyanide, acetic acid, soaps and cobalt oxide were among the most important items on the list. Of the total, 50 per cent. of Canada's exports went to the United States, 20 per cent. to the United Kingdom, and 30 per cent. to other countries, chief among which were Mexico, Japan, Newfoundland, Portuguese Africa, Cuba, New Zealand, Barbados, Australia, China and Chile in the order named.

Prices of chemical products remained at about the same level during 1926. Based on 1913 prices as 100, the Bureau's index number of chemicals and allied products, which showed an average of 157.1 in 1925, was calculated at 157.8 for 1926, with only slight variations from month to month.

New Companies and Company News

P.C. means Private Company and R.O. Registered Office.

JOHNSON & McLEAN, LTD. (P.C.).—Capital £1,500. Objects: To carry on the business of soap manufacturers, etc. The first directors are J. Johnson, W. McLean, and J. A. Culbert. R.O.: 273A Donegall Road, Belfast.

MONARCH LUBRICATING CO., LTD. (P.C.).—Capital £500. Objects: To carry on the business of manufacturers, refiners, importers and exporters of and dealers in lubricating oils and greases, soluble oils, resins, soaps, size, disinfectants, oleine, stearin, wool oils and pitches, etc. The directors are: E. Ludlam and J. M. Brookes, of 2 Ainsdale Grove, Reddish, Stockport.

H. BUCKNER & SON, LTD. (P.C.).—Capital £1,000. Objects: To carry on the business of pharmacy proprietors, dealers in chemicals, medicinal preparations, wines and spirits, opticians and surgical store-keepers, stationers, photographers, radio and electrical engineers, barbers, hairdressers, etc. R.O.: Tankerton Circus, Tankerton Road, Whitstable.

DUNN & SON, LTD. (P.C.).—Capital £200. Objects: To carry on the business of chemists, druggists, dry-salters, grocers, wine and spirit merchants, tobacconists, stationers, booksellers, advertising agents, etc. The directors are: A. Dunn, Lorraine, Station Road, Stanley, merchant, and E. Dunn, Lorraine, Station Road, Stanley, chemist and druggist. Solicitor: G. R. Pawson, Stanley, co. Durham.

FULLER'S EARTH MINING CORPORATION, LTD. (P.C.).—Capital £2,100. Objects: To enter into two agreements with Muros, Ltd., and to carry on the business of manufacturers and workers of and dealers in Fuller's earth, cement, concrete, lime, gravel, sand, minerals, earth, coke, fuel, artificial stone and builders' requisites, quarry masters, etc. The first directors are to be appointed by the subscribers. Solicitors: Ashurst, Morris, Crisp & Co., 17 Throgmorton Avenue, E.C.2.

THE CHEMICAL & INSULATING CO., LTD. (P.C.).—Capital £100,000. Objects: To carry on the business of manufacturing, wholesale and retail chemists; druggists, drysalters, oil and colourmen, manufacturers of and dealers in pharmaceutical, medicinal, chemical, industrial, mineral and other solvents, products, preparations and articles, magnesia, magnesite, asbestos, cork, and all fibrous articles and materials, rubber products and articles, oils, lubricants, paints, pigments and varnishes, soaps, flavouring extracts, dyes, celluloid . . . R.O.: Cockerton, Darlington

COMPANIES DISSOLVED.—Notice has been given in "The London Gazette" that the names of the undermentioned companies have been struck off the register and the companies dissolved:—Benzozates, Ltd.; Blackmoor Chemicals and Colours, Ltd.; Carl Zeiss (London), Ltd.; Dyestuffs, Ltd.; Metallic Chemicals, Ltd.; Sherwood Optical Co., Ltd.; Tyne Chemical Products, Ltd.

GEHE & Co. A.-G.—Gehe & Co. A.-G., Dresden, report for 1926 a slight increase in gross profits, amounting to 2,730,000 marks, against 2,520,000 marks in 1925. After deducting all expenses the year closed with a net profit of 12,375 marks, as compared with a loss of 354,604 marks sustained in 1925. The report states that business in the home market was on the whole satisfactory, while the firm's export trade also showed a slight improvement.

Trade-marks Applied for

The figures in parentheses refer to the classes in which the marks are grouped. A list of classes and particulars as to registration are given in "The Chemist and Druggist Diary," 1926, p. 309.

(From "The Trade-marks Journal," July 27, 1927.)

- "IRAYSL"; for eye lotion (3). By H. C. Moscow, 282 Woodlands Road, Glasgow. 481.668 (Associated.)
- "ORAVOX"; for aids for deaf persons (11). By Pedestros, Ltd., 26 Langham Street, Portland Place, London, W.1. 481.534. (Associated.)
- "LOTUS"; for calcium and soda phosphates (42). By J. Crampton & Co., Ltd., 31 Princess Street, Chester Road, Manchester. 471.507.
- "BOLADEN"; for all goods (42). By Dr. Madaus & Co., Heinrichstrasse 175/175b, Radeburg, Bezirk, Dresden, Germany. 480.100.
- "EUCHRED"; for food substances (42) By H. J. Heinz Co., Ltd., Waxlow Road, Harlesden, London, N.W.10. 481.896.
- "RASFIZ"; for beverage preparations (42). By Stotherts, Ltd., North Road, Atherton, Lancs. 481.923.
- "MUSTARD CLUB"; for all goods (47). By J. & J. Colman, Ltd., Carrow Works, Norwich. 481.070. (Associated.)
- "PETER PAN"; for powder puffs (48). By M. Levy, 129 West 41st Street, New York, U.S.A. 476.247.
- "CRESINA"; for toilet preparations for the skin (48). By J. Stewart, Ltd., 225 Regent Street, London, W.1. 480.502.
- "MAYAMI"; for perfumery, etc. (48). By Prichard & Constance (Manufacturing), Ltd., 11 Broad Street, High Holborn, London, W.C.2. 481.364. (Associated.)
- "OTARYN" with device of girl's head and pine trees; for hair preparations (48). By F. C. Robinson, 23A Westgate, Huddersfield. 481.613. (Associated.)
- "EILENE"; for perfumery, etc. (48). By L. E. Fitzgerald, 3 Milton Park Road, Milton, Weston-super-Mare. 478.878.
- "DUBARRY'S PERLYSIA SHAVING CREAM" on device of shaving brushes and including words "Golden Morn" ("Dubarry's" and shaving brush device disclaimed); for shaving cream (48). By The Dubarry Perfumery Co., Ltd., Hove Park Villas, Hove. 478.356. (Associated.)

Gazette

Partnership Dissolved

WOOD, J., and LOMAX, J., 14 Lowton Street, Radcliffe, Lancashire, chemical merchants, under the style of Wood & Co.

Business Changes

MR. ROBERT WRIGHT, chemist and druggist, has commenced business at 117 Pursfield Terrace, Edinburgh.

MR. GEORGE E. HOPPER, chemist and druggist, has opened a business at Harrogate Road, Rawdon, Leeds.

MR. A. MILNE, chemist and druggist, has taken over the business of Mr. W. T. Gibson, 192 Pleasance, Edinburgh.

MR. J. C. GIBSON, chemist and druggist, who for forty-eight years carried on business at 125 Nottingham Street, Sheffield, has opened a new shop in Darley Dale, Matlock,

Fairchild Scholarship

THE 1927 examination of the Fairchild Scholarship and Prizes was held on June 22 at the following centres:—Cardiff, Edinburgh, London and Manchester. The candidates who complied with all the conditions of entry numbered 59, and 57 sat for the examination, of whom 44 represented England, seven represented Scotland, five represented Wales, and one represented Ireland. It is a matter of great gratification to Mr. Fairchild and the trustees that the number of candidates this year is higher than in any year since the war. Of the 57 candidates who sat for the examination, 42 obtained over 50 per cent. of marks.

The papers written were assessed by Mr. Peter Boa, Ph.C. (practical pharmacy and prescription reading), Mr. James Grier, M.Sc. (chemistry and physics), and Mr. William Kirkby, M.Sc. (business knowledge and botany). The questions were set by Mr. Peter Boa, Ph.C., Mr. James Grier, M.Sc., and Mr. William Kirkby, M.Sc. The following are the results of the examination:—

Miss Eileen Melville, Canton, Cardiff, wins the scholarship with 418 marks out of a possible 500.



MISS E. MELVILLE

Miss Eileen Melville, Canton, Cardiff, was registered at Cardiff and apprenticed to Ladd Brothers, Paget Street, Grangetown, Cardiff. Her present employer is Mr. W. E. Kirkman, Milford-on-Sea, Hants.

Mr. Fred Taylor, Ardwick, Manchester, was registered at Boswick, Manchester, and apprenticed to Mr. C. H. Griffiths, Ashton New Road, Manchester.

Mr. John H. Hall, Edinburgh, was registered at Kelso, and apprenticed to Mr. W. M. Alexander, Kelso. He is at present employed by Paton & Finlay, Edinburgh.

Mr. Ernest G. Hosking, Roath, Cardiff, was registered at Barry Docks, and apprenticed to Rees & Warren, Barry Docks. He is now employed by the Hosking Drug Stores, Pearl Street, Cardiff.

The following is the text of the examination papers:—

Chemistry and Physics

(Time allowed—Two hours)

Illustrate all answers with equations, where possible.

(1) Give a full and complete definition of what is understood by the temperature of a body. Contrast a barometer with a thermometer, pointing out wherein they resemble and differ from each other. Convert -40°C . into F° , also $-38^{\circ}\text{F}^{\circ}$ into C° .

(2) What is a hydrometer? Describe two types and explain why it floats and remains upright. Calculate the specific gravity of a piece of wax from the following data:—Weight of wax in air 20, weight of wax *plus* sinker in water 120, weight of sinker in water 125.

(3) What is understood by the term "allotropy"? Illustrate the occurrence of allotropy by the element sulphur, and give a brief account of the differences to be observed in its allotropes. Starting with sulphur, how would you prepare (a) hydrogen sulphide, (b) sulphur dioxide, (c) sulphur trioxide? If 100 c.c. of a solution of sulphurous acid just decolorise 10 c.c. of a decinormal solution of iodine,

what volume of sulphur dioxide does the solution contain? I. 127, S. 32, O. 16.

(4) Describe the differences in the properties of yellow and red phosphorus and explain how the yellow may be converted into the red modification. How are the chlorides of phosphorus prepared, and what is the action of water upon them? What takes place when phosphorus is heated (a) in dry air, (b) with nitric acid, (c) with soda? What is the relation between the products of the two reactions (a) and (b)?

(5) What is an alum, and what happens to an aluminium salt on adding potash, sodium carbonate, ammonium sulphide? How can it be shown that aluminium is acidio in character?

(6) How are cupric and cuprous chlorides prepared? What happens to a solution of copper sulphate on adding potash, ammonia, potassium iodide, hydrogen sulphide, hypophosphorous acid?

Botany

(Time allowed—One hour)

(1) Write a short account of the part played in the life of a plant by the root, stem and leaves. Take as an example the horse-chestnut or any other plant with which you are familiar.

(2) Describe as precisely as you can the structure of the flower of the dandelion, and compare it with that of the buttercup.

(3) How does the plant obtain its supplies of carbon, oxygen, hydrogen and nitrogen?

(4) What are the sources of spermaceti, tar, manna and camphor, and how are they produced?

Practical Pharmacy and Prescription Reading

(Time allowed—One hour and a half)

(1) What is the strength of diluted phosphoric acid, diluted hydrochloric acid and diluted sulphuric acid? Explain the object of the directions for preparing the last named.

(2) Decoction, infusion. To what form of drug is each adapted? State approximately the constituents of compound decoction of aloe and make plain the *rationale* of the process for its preparation. Supposing infusion of broom and infusion of senega were replaced by a decoction, would the activity of the product be enhanced or deteriorated?

(3) In addition to rectified spirit the Pharmacopœia describes four diluted alcohols. All are designed and used for the extraction of the desired constituents of different drugs. State the character of drug for which they are respectively suitable and supply illustrative examples from your own experience.

(4) Liniment of potassium iodide with soap, suppositories of tannic acid, pill of quinine sulphate. Describe the official process for preparation of these with an account of any precautions to be observed in manipulation in order to obtain satisfactory results.

(5) Translate the following prescriptions into English and render the directions in appropriate language:—

- (a) Potass. citratis, ʒiv .
Hexaminæ, ʒiſs .
Syrup. limonis, ʒss .
Infus. scoparii ad ʒviij .

Solve et misce ut fiat mistura.
Sig.: Cochleare magnum amplum ter in die sumendum.

- (b) R. Pulv. opii, gr. ss.
Quin. sulph., gr. j.
Ext. hyoscy., gr. ij.

Fiat pilula et mitte tales sex.
Sig.: Sumat unam nocte, si opus sit.

Business Knowledge

(Time allowed—One hour)

(1) Write a letter applying for a situation stating the usual particulars including a statement of your experience.
(2) Convert the metric quantities of the following formula into imperial quantities so as to produce a total weight approximately equal to 100 grams:—

Powdered senna leaves	...	...	16 grams
Powdered liquorice root	...	...	16 grams
Powdered fennel fruit	...	...	8 grams
Sublimed sulphur	...	...	8 grams
Sugar, in powder	...	...	52 grams

(3) An article of which the face value is 4s. 6d. costs you 36s. per dozen less 15 per cent. discount—if you sell it at 4s. 3d. what is your percentage profit on the net cost?
(4) What are the conditions under which belladonna plasters, Easton's syrup and spirits of salt may be sold?

Births

Notices for insertion in this column must be properly authenticated.

THOMAS.—On August 1, the wife of Evan J. Thomas, chemist and druggist, Aberayron, of a daughter.

Marriages

NEAVE—DUNCAN.—At St. Peter's Church, Lutton Place, Edinburgh, on July 28, Captain E. W. J. Neave, M.C., B.Sc., A.I.C., to Dorothy Bycroft, daughter of Mr. W. Duncan. Ph.C., late principal of the Royal Dispensary School, Edinburgh.

SALT—HIRST.—At St. Paul's Church, Astley Bridge, Bolton, on July 30, Charles Salt, F.S.M.C., to D. J. Hirst, only daughter of Mr. F. B. Hirst, Ph.C., Bolton.

VEALE—FULLER.—At St. Bartholomew's Church, Ipswich, on July 18, Alfred Henry Veale, M.P.S., to Lillie Fuller, Ipswich.

WILLIAMSON—KIRKNESS.—At the Wesleyan Church, Ashford, Kent, on August 6, J. R. Williamson to Marjorie, only daughter of Mr. R. Kirkness, chemist and druggist, Ashford.

Deaths

GARTHWAITE.—At Lynton, Northfields, Dewsbury, on August 5, Mr. Walter Garthwaite (Garthwaite Bros., Ltd., manufacturing chemists), Boothroyd Lane, aged fifty-two.

PAICE.—At his home, "Clematis," 3 Ruscombe Road, Twyford, Berkshire, on August 6, Mr. Howard Paice, of the representative staff of Francis Newbery & Sons, Ltd., 27-28 Charterhouse Square, London, E.C.1. Mr. Paice had represented Messrs. Newbery during the past four years in Berkshire, Buckinghamshire, Oxfordshire and Wiltshire.

STRANG.—At "The Gables," New Galloway, on July 29, Mr. David James Strang, chemist and druggist, aged seventy-three.

WHALEY.—At Wakefield, recently, following a street accident, Mr. Thomas Cope Whaley, chemist and druggist, 43 Kirkgate, aged sixty-four.

Wills

MR. HUGH AIRD NICHOLSON, 42 New King's Road, Fulham, London, S.W., chemist and druggist, who died on April 22, left estate of the gross value of £1,026 18s. 3d., with net personality £338 11s. 6d.

MR. EDWARD DAY GRAVILL, Ph.C., Bridlington, Yorks, managing director of William Hay, Ltd., manufacturing chemists, Walmsley Street, Hull, who died on May 6, left estate of the gross value of £14,057 11s. 6d., with net personality £8,913 8s. 6d. The testator left £50 each to his daughters, Gladys Marie Gravill, Dorothy Alderidge, and Enid Gravill, his residence and furniture to his wife during widowhood, with remainder in trust for his unmarried daughters, and the residue of the property as to five-eighths in trust for his wife during widowhood, and the remaining three-eighths in trust for his three daughters, and on the remarriage of his wife the ultimate residue to all his children equally.

TRADE-UNION OFFICIAL'S WARNING.—The recent quarterly report of Mr. W. A. Appleton, secretary of the General Federation of Trade Unions, contains the following:—"Care is necessary, while developing the health conscience, to avoid encouraging inordinate desire for drugs. This warning is suggested by the extraordinary increase in medical prescribing for insured persons during 1926. . . . In the area covered by the association there are 847,557 persons for whom the panel doctors prescribe, and for these persons 3,410,469 prescriptions have been made up during the year ending November 1926. This represents a disconcerting increase of 72.3 per cent. over the figures for 1920."

Personalities

MR. JAMES EDMUND HOOPER, who has been engaged on the literary staff at Burroughs Wellcome & Co.'s chief offices, London, E.C.1, for twenty-one years, has been presented by the firm with a chiming clock appropriately inscribed **AND IMPOSED**.

MISS C. B. DUNSFORD, daughter of Mr. T. W. Dunsford, chemist and druggist, Torquay, has passed the B.Sc. examination of London University with second-class honours. Miss Dunsford graduated from University College of the South West, Exeter, where she held a county exhibition.

CERTIFICATES of naturalisation have been granted to Dario Albagli (known as David Albagli), chemical and drugs, produce and general merchant, 1 Haverfield Gardens, Priory Road, Kew; E. M. Berghem, medical practitioner, Heron Cross, Fenton; and C. P. M. Valette, dental surgeon, 40 High Street, Penge.

SR. AGUSTIN DE LA NUEZ AGUILAR, pharmacist, 1 Plaza de Santa Ana, Las Palmas (Grand Canary), is at present in London on a business visit. In view of the fact that goods consigned direct to the Canary Islands are admitted free of duty Señor Aguilar is desirous of inducing British exporters to supply goods ordered by customers in these islands direct, and not from stocks held by agents in Spain on which the Spanish Customs duties have been paid, since no drawback is allowed on consignments dispatched from Spain. In the case of pharmaceutical specialities, the provisions regarding registration, etc., in force in Spain also apply to the Canary Islands.

MR. WILFRID SCARNELL LEAN, this year's winner of the Bell scholarship, is the son of Mr. Wilfrid Lean, Ph.C. (Redwood Research Scholar, 1896), managing director of Francis Hallam, Ltd., chemists, Burton-on-Trent. Educated at the Friends' School, Ackworth, Mr. W. S. Lean passed his London Matriculation with distinction in four subjects in 1922 and was apprenticed in the same year with Young & Sons, Gallowtree Gate, Leicester. Attending part-time classes at the Leicester School of Technology, he passed Part I of the Pharmaceutical Society's examination in 1923 and the Intermediate B.Sc. Lond. in 1924. At the recent examination Mr. Lean also won the second Leverhulme scholarship, but chose to hold the "Bell."



MR. W. S. LEAN

AMONG the overseas callers at this office during the past few days were pharmacists from such widely different parts of the world as New South Wales, Penang and Luxor. Mr. Alexander Brown, of Narrandera, New South Wales, has been having a holiday here for the past six months and returns home in October. Mr. Brown has visited France, Switzerland and his native Scotland, and has much of interest to say about Australian pharmacy. From the Straits Settlement we had a call from Mr. J. M. Chalmers, of The Dispensary, Penang. Most of Mr. Chalmers's holiday so far has been spent in Perthshire, and he returns to Penang in October. Mr. Peter Hampton, who is the proprietor of the English Pharmacy at Cairo and at Luxor, is home on his usual four or five months' holiday, and he reports very good business last year and this year with American and English tourists. We understand that Mr. W. Lane, of the Lane Medicine Company, Oamaru, New Zealand, is likewise in London, and we shall be glad if any of our readers can give us his address, as we have been asked for it by a friend of Mr. Lane's, who called at the office the other day.

Trade Notes

AYRTON, SAUNDERS & Co., LTD., Hanover Street, Liverpool, inform us that the expansion of their business has necessitated the addition of a new wing to their manufacturing laboratories.

BELLCHAMBERS GLASS BOTTLE Co., LTD., Highbury, London, N.5, specialise in the production of high-class white flint bottles, and claim to be the largest manufacturers of stoppered perfumery bottles in Great Britain.

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FORWARD BUYING.—With the approach of the eucalyptus oil season most chemists will be interested in an offer made elsewhere in this issue by Lyptol, Ltd., manufacturing chemists, Harrow, who are also the proprietors of Lyptol, Citrolene and Lypticide.

LABORATORY APPARATUS.—A new price list dealing with chemical apparatus and laboratory requisites has been issued by Southall Bros. & Barclay, Ltd., 220 Corporation Street, Birmingham. Copiously illustrated, and provided with an excellent index, the list will be sent to C. & D. subscribers post free on application.

MR. PAUL, senior partner in B. K. Paul & Co., Calcutta, accompanied by Mr. Nag and Mr. Sadhu,



Seated (left to right): Mr. Scott (general manager, the Wardle Cotton Co., Ltd.), Mr. Sadhu, Mr. H. S. Paul, Mr. Nag, Mr. Hacking (managing director).

recently visited the premises of The Wardle Cotton Co., Ltd., Manchester, as well as their works at Rochdale, where the accompanying photograph was taken.

NEW BEAUTY PRODUCTS.—Khasana, Ltd., 131/2 Bunhill Row, London, E.C.1, announce that, commencing August 18, there is to be a big national advertising campaign in connection with their beauty products. In addition to the rate of profit on these articles, attention is drawn to the lip stick and rouge, which are orange in colour and change on application to the skin to the shade demanded by the complexion.

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we have been impressed by its remarkable resistance to mechanical injury. The Lignose Colour Films are supplied in all standard sizes in the form of film packs for four exposures, roll film for three exposures, and flat films (in packets of four), as well as the indispensable filters, by Peeling & Van Neck, Ltd., 4-6 Holborn Circus, London, E.C.1, from whom full particulars can be obtained, and who also undertake to develop these colour films.

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PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—The number of members elected at the council meeting of August 3 is 191, and not as given in our issue of August 6.

Observations and Reflections

By Xrayser III

Your Further Reference

to that most interesting address delivered before the Hunterian Society by Dr. W. Thomson Brown (*C. & D.*, August 6, p. 178) reminds me that I have recently been provided with evidence from more than one well-informed quarter regarding the prescribing of medicine that is not needed. Two medical practitioners have confirmed the opinion of Epictetus, as quoted by Dr. Brown, to the effect that patients are dissatisfied if the doctor they consult does not give them medicine or a prescription for such. Both were convinced that many patients, if sent away without medicine, though told that medicine was not necessary in their particular case, would simply make their way to another practitioner whose ability would be valued in proportion to the extent that he was willing to pander to their desire to dose themselves. I suggested to one of my medical friends that a large proportion of the medicine he prescribed for insured persons might be unnecessary. He agreed, and admitted further that probably half the medicine he found it politic to order was literally wasted. "But," he added, "if I did not order it they would not be content until they had changed their panel doctor, and they would experience no difficulty in finding one who had no scruples about ordering unnecessary medicine." My other medical friend was not on the panel, but his view of the attitude likely to be taken up by private patients to whom he might give advice without medicine was practically the same. Most people who consult a doctor do so with the idea of needing to take medicine, and quite a large proportion of them are not happy unless they get it. Hence much of the alleged over-prescribing for insured persons.

In a Letter

published in the "Westminster Gazette" a few weeks ago, Dr. Herbert A. Smith referred to "the deeply rooted conviction in the public . . . that for cure drugs must be resorted to, and that he who adopts an artillery of means to an end with skill the sooner cures his patients." Continuing, he added that a large number of prescriptions which add to the drug bill are for paltry affections in patients who "trespass on panel privileges." About the same time Mr. James Douglas was writing in the "Daily Express" on "The Menace of Medicine," beginning his alarmist communication with the statement that we are "on the way to becoming a race of medicine drunkards." He fathered this warning on the principal secretary to the Ministry of Health, who had evidently been inspired by recently published figures concerning the consumption of medicine by insured persons in Manchester and Salford. But Mr. Douglas rightly pointed out that faith in the medicine bottle is not confined to insured persons. "It is a universal superstition. The family doctor is expected to prescribe whenever he is called in. He would lose his patients if he advised them to become total abstainers from medicine." We thus find both doctors and laymen telling the same tale, which happens to be one that any chemist and druggist could confirm tenfold. But it is obviously to the chemists' advantage that much medicine should be consumed, and I do not doubt that evidence could be furnished to show that assumedly unnecessary medicine is not necessarily so. Doctors sometimes prescribe more wisely than they know when they order medicine they do not think is really required by the patient.

Dr. Burn's Paper,

read at the Brighton meeting of delegates of branches of the Pharmaceutical Society (*C. & D.*, July 2, p. 40), is to be further discussed, according to your report of the August Council meeting. It will probably be remembered that Dr. Burn dealt with the training of pharmacists, with particular reference to their future position in the health service of the country. He would have the pharmacist trained "in those new

methods which could maintain and increase his professional position," meaning methods of discovering the nature of disease and of curing disease, as at present practised in certain hospitals but not generally. The proposed training would include the performance of sterility tests, the preparation of vaccines, the examination of throat swabs for the diphtheria bacillus, the examination of sputum for the tubercle bacillus, the estimation of sugar in blood and urine, the use of x-ray apparatus, and so forth. It was suggested that the Pharmaceutical Society might issue a diploma in pathological methods to those sufficiently well trained, and the hope was also expressed by Dr. Burn that schools of pharmacy in different parts of the country would face the problem of providing the necessary training. Hospital pharmacists and a few in general practice are already doing work of the kind indicated, but it is doubtful if there would be room for many others to undertake it. The number required in any town would naturally depend upon the number of doctors practising there, the degree to which enlightenment about the new pathological methods had spread in the district, the willingness of the public to remunerate the pharmacist properly for his special services, and—last, but not least—disposition on the part of the medical profession to utilise the services of local pharmacists instead of relying upon the necessary work being done at some so-called medical research institute run for private profit.

Misapprehension

of what is required by the syllabus of the pharmaceutical examinations is excusable during the present transition period, and I find myself much in sympathy with a correspondent whose letter you published not long ago. Your correspondent was probably brought up on Atfield's "Chemistry" and Bentley's "Botany," both excellent works in their time, which used as illustrations substances or processes familiar in the pharmacy. School courses of instruction followed similar lines in those days. But times are changed; and the new rule to prevail is that botany, chemistry and physics must be studied by our apprentices in the same way that they are studied by others, without direct application to pharmacy or any other art or craft. There is much in favour of this plan, and students who are worth their salt may be expected to take broader views of the sciences they study if their knowledge is not circumscribed by the walls of the pharmacy where they are trained. As to the ground covered by the syllabus, it is true that quite a few words may involve a great deal, but I think it is equally certain that examiners who expect too much are soon taught to be reasonable in their views.

Making Dispensing Pay

is not easy unless one works on the system which has as its basis the *C. & D.* Retail and Dispensing Price List. If taken by itself, it may not pay one, assuming the word "pay" to be interpreted in a proper business sense. But the work ought not, in any case, to be done at a loss, and that is why I am not keen on securing the dispensing of medicines for dependants of insured persons on the prevailing terms. Unfortunately we are not all in agreement on the question of profits. On the one hand, we are worried by the person who will not play the game by adhering to the prices marked on prescriptions by previous dispensers; on the other hand is the chemist who will continue to contract for the supply of medicines to insured persons however much the remuneration may be cut down. As an important addition to the list of unsolved questions let me suggest a further one—how to deal with those who will not play the game in the direction indicated.

MAKING HISTORY.—In announcing the visit of the President of the Pharmaceutical Society of Great Britain and Mr. Marns to Canada (recorded in *THE CHEMIST AND DRUGGIST* of August 6), "The Times" of August 11 states that this is the first time that a president of the society has been in Canada or the United States during his term of office.

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Editorial Articles

The Educational Position

THE Annual Educational Number of THE CHEMIST AND DRUGGIST provides a suitable occasion when the position of examinations and training in pharmacy and allied sciences may be reviewed. The various syllabuses are set out, bringing the information up to date, together with hints and comments arising from critical scrutiny of results during the past twelve months. Pharmacy is the particular interest; and looking back we note that consolidation of training and harmonising it with the expectations of a wide-flung syllabus was the effort of last year. The problem is similar now, or, it might be said, it has become a little more insoluble owing to the desire of the Pharmaceutical Society's Council to do the easy thing and wait to see what the year 1929 might reveal before grappling with problems which must be

quite as apparent to them as to anyone else. First, the syllabus has undergone no change, but examinees appear to be under the impression that it has been, or is in process of being, moulded by an interpretation put upon it by examiners. The excessive detail in the syllabus lends itself to confused notions in the minds of examiners, teachers and students alike. It must be so when minds can roam at will, browsing upon so many often unconnected things that are useless for the practical work of keeping open shop. Systematic training is the desirable thing, yet in no sense is the examinee required to demonstrate by his collegiate course that the galenicals he is called upon to handle, and be responsible for in law, exist for him in any other sense but the name, as a thing to be sold or dispensed like a stamped proprietary. The habit of guarantee by wholesale houses, encouraged by the Chemists' Defence Association, tends to stultify personal interest and responsibility in the drugs, chemicals and galenicals which are the stock-in-trade of the pharmacy. Moreover, this same shifting of the onus affects the schools, and original testing, preparation or examination by the students scarcely exists—or if it does, it is performed by a demonstrator for the admiration of the students. Almost completely, pharmacy in all its phases can be made a practical examination; by "practical" we mean one in which experimental work can be done. The simplest galenicals present to the majority the tedious process of dealing with the unknown, and fumbling with the material is the rule and not the exception. We are told that nervousness is the most ruinous cause of the candidates' chances; but in reality it is unfamiliarity with processes which should be familiar, a lack of personal acquaintance with simple appliances and methods which should be almost second nature; this could only arise if the book study was made a little more subordinate to the practical work. One can scarcely blame the schools, the candidates, or even the partial shop training; the fault, truly, lies with the Pharmaceutical Council in thinking and expressing itself in terms of theory rather than practice. Every apprentice must now be duly indentured, and as a first step it is sound policy; but if no second step is taken to see that the places where training is undertaken are fitting for the purpose, then the first step will be futile in producing better results. The coming year, so far as examinations are concerned, will be a repetition of the past—a procession of students sadly unprepared for the examinational ordeal, a sequence of "failures" or "refers" streaked with a splash of brightness from a select few who have been trained in scientific method. Only an examiner can appreciate the joy of meeting a student soundly trained for expressing in deeds or words the knowledge he has acquired during his pupilage. We have suggested in successive years that in "viva" examinations two examiners would save capitalising questions, which might react by improving training; apparently this is too costly or too slow a process. It is a moot point whether or not more candidates could be examined by such an arrangement than leaving it for one examiner spending an hour laboriously digging for information that is not there. It is fairer to the candidate to meet with two types of mind than one; he might react to one or the other more easily. Great expectations were natural when we knew the standard of the Preliminary examination was raised; it is well to know also that it is not in the subjects but in the standard that the elevation has taken place. It is too early to pass any opinion on results, as these cannot be available for the purpose until about 1930; but from a variety of sources we hear that some of those expectations are doomed to disappointment. The raising of a standard by an increase of ten per cent. in marks on the same examination papers is not likely to produce any

elevating results. It makes one wonder what is the use of talking about raised standards for the "Preliminary." The prospect of 1930 is no brighter than that of the present year in fundamental arts training. At the Brighton meeting of the educationists it was commonly reported that one of the teachers had the temerity to suggest to the Pharmaceutical Council the advisability of setting up a true Education Committee by co-opting two or three teachers to tone dogmatic educationists by the presence of those who had practical experience of applying educational principles. And we are not disposed to cavil at such a procedure. The people who apply the principles know wherein comes the pinch; at least, it might save us from some of the enigmatical regulations which surround the aspirant for qualification. It is a desirable reform to set up an experienced education committee not entirely dependent upon the votes of electors for governance only. This period of transition makes it incumbent that experienced teachers in suitable proportion should be called in to assist in the tide over, as 1929 will see the big change to written papers with "vivas" where considered advisable. The perfunctory gathering of teachers with councillors whose knowledge of education appears to be limited by their capacity for wordy expression (before small meetings) of their devotion to educational upbringing at a Conference called for another purpose, where social attractions are in the ascendancy, is unsatisfactory. No matter what suggestion is put forward, there can be no guarantee that it will be considered from the expert point of view if there are no experts there. The Education Committee of the Pharmaceutical Society's Council would become a real one if the suggestion of this innovator at the Brighton Conference was honoured in practice. A beginning has been made from the University side by the success of the first graduate in pharmacy. It is gratifying to women to find that one of their sex leads the van, but already many are beginning to be dubious about the prospects of a Bachelor in Pharmacy in his or her relative value with a Bachelor of Science having a pharmacy qualification. There should be no real difference, and perhaps it is the novelty of the degree which will affect the present generation; the future will be with the new bachelors if they are of the right material, and themselves determined to make good. One further suggestion, made by Dr. Burn in a paper read before the delegates at the Brighton Conference, marks the past year. Many personal experiences were given which had a bearing on the subject, and most of them recorded failure to secure recognition for what might be termed biological work. Whether such development is possible or advisable in the present state of flux of the general question of pharmaceutical education it is difficult to say. It is not sufficient to declare a need without suggesting something; a committee of experts ought to examine the whole question in relation to public services and its association or otherwise with pharmaceutical analysis. We know the need exists now, and many are fumbling towards a solution of the problem, which only positive application of thought is likely to solve. We hope it is not too much to expect the Council to see the seed intelligently sown rather than scattered. The scholarships gave better results this year; numbers were increased to twenty-one for the Jacob Bell, seven for the Manchester, fifty-six for the three Leverhulme, and fifty-nine for the Fairchild. We can only repeat what we said last year; these scholarships are well worth having, and employers should call the attention of apprentices to them in the interests of both. There should be at least 150 entrants for the open scholarships. It will be seen that problems of training and examination are still waiting for solution, and only a combination of teachers and the framers of regulations and the syllabus can bring reasonable order out of a somewhat confused position.

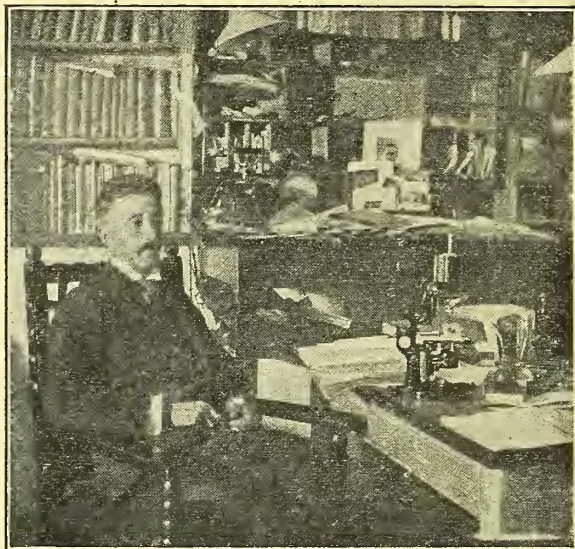
The Passing of the Major

ALL chemists and druggists who succeeded in passing their Qualifying examination before November 1 last have nine months left if they wish to qualify as pharmaceutical chemists under the old conditions. The passing of the "Major" is the passing of an epoch. The examination was on an archaic syllabus unchanged for twenty years. It had served a useful purpose, and some of the best men pharmacy has produced passed through the portals of this Major examination, and have left permanent results in moulding the fabric of pharmacy. The failures at the examination in July were two-thirds of those who entered, and it is safe to assume that next April and July will see very few try again, since no systematic training is likely to be undertaken. Many will regret the passing, for the newer examination is made so tedious that it gives every promise of reducing to the smallest dimensions the Register of Pharmaceutical Chemists. It is certain as the sunrise that the new Pharmaceutical Chemist examinations and training will have to be reconstructed in the light of logical reasoning. Fantastic aspirations after a newly created degree which will require years to make good need to be sifted out to form something tangible and practically useful. Dr. Burn's paper at the Brighton Conference showed a way for the development of a newer and modern "Major"; had this been followed when suggested seven years ago, we should by now have had, something live and real instead of the present pretension. The next academic term finds us without anyone training for the old "Major"; and for all practical purposes it is dead, awaiting the funeral obsequies next summer. We wonder whether it is too much to ask the Pharmaceutical Society's Council to apply some of its energy to reconsidering the position as it is now, so as to bring the Pharmaceutical Chemist examination in touch with reality, and not try to attach so much value to academic distinction. The need is great; men with knowledge are in our midst, but something paralyzes their initiative. Practical reconsideration must take place, or the only other alternative is to give to the chemist and druggist the title of pharmaceutical chemist in order to save it from gradual extinction by inanition.

The Polish Curriculum

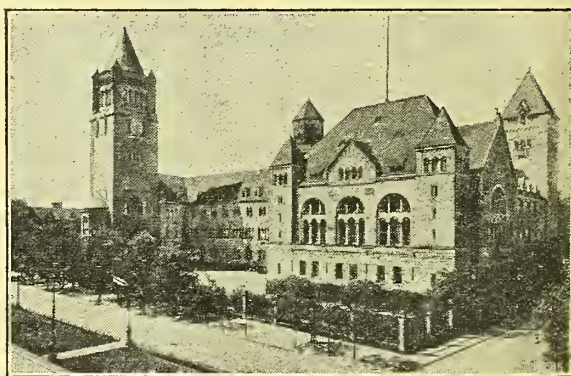
WITH the re-establishment of Poland as an independent State the new republic was confronted with the problem of co-ordinating the three distinct systems of pharmacy—Austrian, Prussian and Russian—hitherto in force in the respective territories into which the country had been divided for over a century. A new uniform pharmacy law for the whole of Poland has been under discussion for some time past, and its enforcement is now imminent; in the meantime various regulations have been passed since 1918 to ensure, as far as possible, the smooth working of the former Austrian, Prussian and Russian pharmacy laws still in force. On the other hand, uniformity has already been secured in one direction, i.e., in the professional education of the Polish pharmacist. The entrant into the profession is now required to possess the Matriculation certificate, and is given the choice of either taking up the prescribed course of University study at once on leaving school, or of first serving in a pharmacy and then passing the pharmacy assistant's examination before attending a University. However, since over 70 per cent. of the candidates prefer to go direct to a University, it was found necessary to make provision for giving the students the indispensable practical as well as technical instruction in pharmacy by fitting up model pharmacies, which are used exclusively for instructional purposes and are not open to the public. In these the student receives instruction in the art of dispensing and in making galenicals, as well as attending to all the other duties which form the daily routine of his profession. The prescribed course of study at a University extends to three years, the first two years being devoted to acquiring a fundamental knowledge of chemistry, botany, physics, materia medica, bacteriology, physical chemistry, biological chemistry, zoology, and geology. The third year is devoted to attending special lectures on pharmaceutical chemistry,

organic chemistry, general hygiene, materia medica, the art of dispensing, cultivation of medicinal plants, analysis of foods, first-aid in accidents, and pharmaceutical legislation, in addition to practical work in the laboratory. At the end of each year an examination is held, which includes tests of the practical knowledge acquired in the laboratory, while the final examination takes place at the end of the third year. The qualification itself, however,



UNIVERSITY OF POZNAN.—Professor Hrynakowski, Director of the Pharmaceutical Department, in his study.

is not granted until the candidate has spent a period of three years as an assistant in one or more pharmacies. To obtain the degree of Master of Pharmacy a further year has to be spent at the University attending courses in pharmaceutical chemistry, history of pharmacy, extraction of active principles from plants, cultivation of medicinal plants, manufacture of serums and vaccines, and pharmaceutical toxicology, in addition to presenting a thesis. Poland possesses five Universities: Warsaw, Cracow, Poznan, Lwow (Lemberg) and Vilno. With the exception of Lwow these Universities are each provided with a pharmaceutical department attached either to the Faculty of Philosophy, Medicine or Natural Sciences, while recently an independent Pharmaceutical Faculty was



UNIVERSITY OF POZNAN.—The former Prussian Royal Castle in which the Pharmaceutical Department is temporarily housed.

added to the University of Warsaw (*C. & D.*, 1926, II, p. 200). The number of students of pharmacy at the University of Poznan, now about 200, is steadily increasing from year to year, and for this reason it has been decided to build an extensive new laboratory. At present, the chemical and pharmaceutical laboratories are housed partly in the University building, and partly on the ground floor of the former Prussian Royal castle built by the ex-Emperor William II.

EDUCATIONAL INFORMATION



Pharmacy

GREAT BRITAIN

THE pharmaceutical Qualifying examination is conducted on the basis of a division into two parts. Candidates may enter for both parts at the same time, but this only applies to students who are registered and able to complete their periods of study, and service in a shop, before August 1, 1929. For those entering pharmacy it is better to consider it as consisting of two examinations as laid down in the new regulations, which are termed: Preliminary Scientific, and Chemist and Druggist Qualifying examination. In addition, there is the further qualification of pharmaceutical chemist, available for the chemist and druggist on the old terms, if registered before November 1, 1926, but this concession expires in July 1928. The regulations governing the examinations are set out in the following pages, including those required by the London University for internal and external students. Reservation is made for vested interest, and adequate allowance is given for the change over. It is necessary that students should consider carefully the regulations, especially the point that examiners require the laboratory books. This requirement of books is an essential factor in the examination, as a visible demonstration of systematic work helps considerably in the elucidation of weak and faltering replies, and slackness or carelessness in keeping these books cannot fail to create an atmosphere likely to be detrimental to candidates who are on the borderline of pass or refer. Claim can still be made to study under the old hours, but as they are admittedly unsatisfactory, the newer allocation ought to be accepted. The hours under the new regulations are only compulsory after the end of 1928. The old registered student or one who has passed Part I will find no change, and his period for passing under the old rules does not expire before August 1929; he may, and should, see to it that his fees are unchanged by the same concession.

The great change made by the new regulations was a break with tradition, whereby examinations for a pharmacy career are no longer wholly conducted by the Pharmaceutical Society. Students who have passed recognised science examinations are increasing in number; and it is admitted as a satisfactory way to enter pharmacy wherever facilities are available. Crowding the two parts together is the cause, in the majority of cases, which leads to failure. The impression that the

examinations are to be made harder still prevails, which probably explains the extraordinary number of candidates entering for the examinations on what is quite clearly unsatisfactory training. During the month of July the total was over 1,600. It cannot be over-emphasised that there is no real change in the scope of the examinations, and not the slightest cause for hurried entrance in order to avoid something more severe later on. The change over in the Society's examination takes place in 1929, and it is one of method and allocation of time and not scope. Those who

are entering, or contemplating entering, pharmacy through the portals of the London University are on the reformed syllabus. Several schools are, and more will be, recognised for the training of students, subject to the institutions conforming with the requirements of the University. The syllabus for the Intermediate examination in science differs from the Preliminary scientific in pharmacy: an outline is set out under the University degree. Students who can find the time and have the inclination to study in a methodical manner will find the examinations provided by the London University one of the best ways to become a pharmaceutical chemist. This presupposes matriculation has been passed before leaving school, which is the only rational method. In spite of all that has been said and written

Chemist and Druggist or Pharmaceutical Chemist Qualification

(IN BRIEF)

1. Notification and registration with the Pharmaceutical Society of having passed an approved Preliminary examination.
2. Apprenticeship (indentured), during which provision should be made for attendance in approved technical institutions of 300 hours in chemistry, 60 hours in botany, 60 hours in physics (until June 1, 1929); alternatively (new syllabus), chemistry 200, botany 120, physics 120.
3. Take Preliminary Scientific examination in chemistry, botany and physics.
4. Complete the necessary 4,000 hours' experience in an open shop or approved public institution, during which, or after, spend 300 hours in pharmacy, 120 hours in pharmacognosy, 300 in pharmaceutical chemistry, in an approved school, or 2,000 hours if proceeding for pharmaceutical chemist only, and collegiate hours: pharmacy 620, pharmacognosy 270, chemistry 440, botany 270.
5. At the age of 21, or thereafter, Chemist and Druggist Qualifying examination in pharmacy, pharmaceutical chemistry, pharmacognosy, forensic pharmacy; or pharmaceutical chemist qualification in pharmacy, pharmacognosy, chemistry, botany, and forensic pharmacy.

during the past few years, the results of the examinations both in London and Edinburgh continue to show an absence of systematic training. It is not sufficient to depend upon a sequence of hours in college; these may comply with all the requirements of scholastic training, but nothing in a school can replace the daily routine of the shop or institution, which should lay the foundation for the subsequent orientation of the collegiate courses. We recommend that use should be made in the pharmacy of the syllabus outlined in the following pages. The preparation of galenicals is a rare thing in the shop routine, but the possibility of making small quantities should not be overlooked by the employer, as it is of vital consequence to the apprentice. It makes all the difference in knowledge and experience in reply to the examiners' questions if actual personal work on these lines has been done. The student should arrange his work to provide a thorough grounding. It is also advisable for students who are eligible to train and enter for the scholarships now available in pharmacy; they provide an incentive to study and lay the foundation for doing things in a methodical manner.

Educational Information

Preliminary Examinations

The first step on deciding to take up pharmacy is to secure a certificate covering the following compulsory subjects: English, arithmetic, algebra, geometry, and two optional subjects, of which it is recommended that Latin should be one. These subjects must have been passed at not more than two examinations of the same examining authority. The registrar is empowered to accept certificates covering the six subjects, and with the proviso stated above, but any deviation from this may be considered by the Pharmaceutical Council on its merits. It should be clearly understood that the new preliminary examinations do not differ in subjects, but a higher standard of marks is required. The list of certificates at present accepted automatically is given below. Any student entering pharmacy and desirous of obtaining a degree through the London University must pass its matriculation examination.

LIST OF CERTIFICATES ACCEPTED

- Army Council.*—First-class Education Examination.
Queen's University, Belfast.—Matriculation Examination.
Universities of Birmingham, Leeds, Liverpool, Manchester, and Sheffield.—Joint Matriculation Examination.
 School Certificate Examination.
University of Bristol.—School Certificate Examination.
University of Cambridge.—Senior Local Examination.
College of Preceptors.—Senior Certificate Examination.
University of Dublin.—Public Entrance Examinations. (For "High Places.")
University of Durham.—School Certificate Examination. Higher Certificate Examination. Certificate of Proficiency Examination.
Universities of Edinburgh, Aberdeen, Glasgow, and St. Andrews.—Preliminary Examination in Arts, Medicine, or Science. Senior Local Examination. Higher Local Examination. Previous Examination.
Intermediate Education Board for Ireland.—Senior or Middle Grade Certificate Examination.
Educational Institute of Scotland.—Medical Preliminary Examination. Professional Preliminary Examination.
Pharmaceutical Society of Ireland.—Preliminary Examination.
National University of Ireland.—Matriculation Examination.
University of London.—Matriculation Examination. Higher School-leaving Certificate. Senior School Examination.
University of Oxford.—Senior Local Examination. Higher Local Examination. Responsions.
Oxford and Cambridge Schools Examination.—Higher or Lower Certificate Examination.
Scottish Education Department.—The Intermediate Certificate or Passes in the Higher or Lower Grade of the Leaving Certificate Examination.
Central Welsh Board.—Honours, Senior Certificate Examination.
University of Wales.—Matriculation Examination.

If a student has passed an entrance examination of any other body not referred to in the above list he should submit it to the Registrar of the Pharmaceutical Society, 17 Bloomsbury Square, London, W.C.1. The list of accepted certificates covers the Empire's universities, so that the conditions practically only apply to foreign institutions. It may generally be said that only two certificates to cover the whole examination are accepted, not three as heretofore. If the student has not already passed one of the examinations his apprenticeship is of no value until he has acquired the necessary certificate. The favourite examinations for pharmacy students are the certificate of the College of Preceptors, London, and the professional preliminary examination of the Educational Institute of Scotland. Of these we give particulars below, and refer students for fuller details to the syllabus of the various

bodies or to Dodd's "Guide to Preliminary Examinations" (C. & D. Office, 3s. 6d., by post 3s. 11d.).

THE COLLEGE OF PRECEPTORS, Bloomsbury Square, London, W.C.1, holds examinations for junior preliminary certificates at midsummer and Christmas at local centres, a list of which is issued two months before each examination. Entry forms, obtainable from the secretary of the College, must be filled up and returned six weeks before the day appointed for the examination. On the form the candidate indicates the subjects in which he desires to be examined, those required for pharmaceutical students being mentioned at the beginning of this section. The fees payable are 20s. and a local fee, the amount of which varies, but information as to the payment will be supplied two months before the examination. The fees are best sent with the entry forms, but, if not, must be paid twenty-eight days before the examination begins. Candidates should obtain the regulations for the examinations (post free) from the secretary of the College, as the books to be studied in some of the subjects vary from year to year. A complete set of papers at previous examinations can be obtained from the College at 2s. 3d., post free. This still holds good, as it is more a question of standard reached in the answers and not in the subjects. Collected papers on each subject are obtainable from Mr. P. C. Bartlett, 27 Southampton Street, Strand, London, W.C.2.

EDUCATIONAL INSTITUTE OF SCOTLAND (Registrar's Office, 47 Moray Place, Edinburgh) holds a preliminary examination for pharmaceutical students four times a year in Edinburgh, Glasgow, London, Liverpool, and Dublin. The fee is £1, and 10s. 6d. for any subsequent examination, and should be sent to the Registrar with the form of application duly filled in. Exemption can be claimed from subjects already passed on a Leaving certificate. The Institute issues a calendar giving the regulations and examination papers, which can be obtained from the Registrar, price, by post, 1s.

A certificate of having passed a preliminary examination complying with the conditions having been obtained, it should be sent to the Registrar, the Pharmaceutical Society, 17 Bloomsbury Square, London, W.C.1, accompanied by a fee of two guineas, the student being then registered as an "apprentice or student."

Registration is insufficient in itself; articles of pupillage must be taken up and filed, copies of which can be obtained from the Registrar at the same time. Apprenticeship may be served with a pharmacist, firm, or body corporate, or in an institution recognised by the Council of the Pharmaceutical Society. The specified number of hours required to be spent in an open shop (or approved public institution is 4,000. The student who chooses to follow the course mapped out for a pharmaceutical chemist will be required to serve 2,000 hours in a shop kept open for the retailing, compounding, and dispensing of poisons or the dispensary of a hospital or similar institution approved for the purpose, and must also enter into similar articles of pupillage. In addition, a recognised course of study must be taken before any portion of the Qualifying examination can be attempted.

The Technical Examination

The Board of Examiners sits in London and Edinburgh in January, April, July and October for the purpose of conducting the statutory examinations—for the Pharmaceutical Chemist examination in April and July only. The Qualifying examination is still considered and treated as being in two parts, the first one including botany, chemistry and physics and now called the Preliminary Scientific, the second pharmacognosy, pharmacy, pharmaceutical chemistry, dispensing and forensic pharmacy. This latter portion is called the Chemist and Druggist Qualifying examination. For the purpose of simplification the Pharmaceutical Chemist qualification is dealt with separately under that heading.

The Preliminary Scientific can be taken between the ages of eighteen and twenty-one, the Qualifying examination only after the age of twenty-one has been reached.

Educational Information

* The fee payable for the Preliminary Scientific is six guineas, and the conditions are: The candidate must have spent the requisite number of hours in botany, chemistry and physics in an institution approved for the purpose by the Pharmaceutical Society's Council. If a candidate is referred in one subject only, he may re-enter for that one only. Two "refers" are equivalent to a failure in all. The re-examination fee is £4 4s. Failure in one subject means re-examination in all, and the fee is the same.

Having passed each subject in the Preliminary Scientific and completed 4,000 hours, not less than two years, in an open shop or approved public institution and reached the age of twenty-one, the candidate should send a birth certificate, together with another fee of £12 12s. and the necessary declaration of having completed the conditions on the prescribed form, to the Registrar. The examination is conducted on similar lines, and success in all subjects entitles the candidate to be registered as a chemist and druggist by examination.

All candidates have the choice of being examined in London or Edinburgh, and they are required to state the venue desired when filling up the entrance form. It should be made quite clear that all present registered students are held as under contract until August 1, 1929, with the Pharmaceutical Society, and are entitled to pay the fees prevailing when they were registered, and to enter at one and the same time for the whole examination; but they must pass the Preliminary Scientific before proceeding to the Chemist and Druggist Qualifying examination.

The Examination Syllabuses

The official syllabus of the Pharmaceutical Society for the Preliminary Scientific is set out, though examinations in lieu of this may be taken in approved institutions.

Preliminary Scientific.

BOTANY

Morphology, including anatomy. The external form of plants: Thallus, root, stem, leaf. The distinguishing features and commoner modifications of these structures. Buds and veneration. Principles of branching and different kinds of branch systems. Phyllotaxis and branching. Inflorescence, flower, fruit. Pollination. Self and cross fertilisation. The formation of the seed. Germination. A general acquaintance with the elements of plant anatomy; the vegetable cell, tissues, e.g., meristematic, epidermal, fundamental and vascular. The characteristic anatomical features of roots, stems and leaves of flowering plants and ferns. The method of increase in thickness of stems and roots, and the characters of primary and secondary tissues.

The elements of physiology. The nature and source of the food of plants, and the manner in which the raw materials are elaborated. Chlorophyll, its manner of occurrence in the plant; its functions and the conditions under which it discharges them. Reserve materials, their nature, mode of deposition, and the manner in which they are utilised by the plant. The manner in which plants grow, and the conditions necessary for the growth of a plant. The manner in which plants respond to external stimuli—e.g., light, gravity, etc. Sexual and asexual reproduction.

This subject does not appear to be a very popular one, and we can only repeat the advice so frequently given in past years. Nature at first hand, with a competent and handy guide like "Pharmaceutical Botany" (C. & D.) in the pocket, will teach more botany than weeks of cramming unessential details. From the results of the examinations it appears that students make it a book subject only: while, more and more, the examiners are emphatic on the practical side, and place before examinees equipment demonstrating the physiological processes, so that candidates should make it a point to experiment for themselves with growth, root pressure, assimilation and so on. Fresh material is always available, and must be handled if sound knowledge is to be acquired. Any examiner can see at a glance whether a student has first-hand acquaintance from practical experiments rather than illustrations from a book. In microscopic work—spotting the slides, as it is called—it would appear that many students have never given it serious attention; and why a student should not

try to make slides for himself is something of a mystery. He certainly has plenty of time in the allocation of hours. Some excellent specimens of wood are available, but these too often produce a strange look in the candidate, which gives him away when he tries to explain. Practical experience is needed, and no student can feel confident in this subject unless he has met Nature at first hand, learns her secret, and stops guessing what things are. To guess is to flounder, and that means failure. The botanical gardens are open, and material in ordinary gardens and hedgerows is abundant for personal experiments on living material, which adds zest to the study, and, what is more important still, makes success certain at the first time of asking.

Classification.—A general knowledge of the chief divisions of the vegetable kingdom, including a special study of the plants and families named.

THALLOPHYTA.

Algæ:—Spirogyra, fucus.

Fungi:—Agaricus, saccharomyces, bacillus.

BRYOPHYTA.

Funaria and Pellia.

PTERIDOPHYTA.

Dryopteris felix-mas.

SPERMOPHYTA.

Gymnospermæ:—Pinices, with only the general external features of Cycas and Taxus.

ANGIOSPERMÆ.

Dicotyledones:—Ranunculacæ, Cruciferæ, Leguminosæ, Umbelliferæ, Compositæ, Scrophulariacæ, Labiatæ, Solanacæ, Salicacæ.

Monocotyledones:—Graminacæ, Liliacæ.

Practical Examination.—To dissect, examine and describe any plants or parts of plants, and to refer to their systematic position any plants belonging to the above-named families. To prepare for the microscope and describe sections illustrating the anatomy mentioned above, and, if necessary, bring laboratory note-books.

While the present registered students may proceed to examination on a 60 hours' course in botany until June 1, 1929, the revised syllabus provides for 120 hours by taking a portion from chemistry. A written examination is to be introduced in 1929.

CHEMISTRY

An elementary knowledge is required of the following subjects:—

(a) The chief characteristics of chemical action, the distinction of elements and compounds; the laws of chemical combination by weight and volume; the hypothesis of Avogadro; atomic weight and molecular weight; chemical formulas and nomenclature; valency; the distinction between metals and non-metals, and the periodic classification of the elements. (b) The general characters of the non-metals; the chief methods of preparation and the typical reactions of the following non-metallic elements and compounds: Hydrogen, oxygen, ozone, water, hydrogen peroxide, chlorine, bromine and iodine, and their compounds with hydrogen and oxygen; fluorine, hydrofluoric acid, nitrogen, ammonia and ammonium compounds, the oxides of nitrogen, nitrous acid, nitric acid; sulphur, hydrogen sulphide, sulphurous and sulphuric anhydrides and acids, thiosulphuric acid; phosphorus, the oxides and oxy-acids of phosphorus, the chlorides of phosphorus, silicon, silica, boron, boric acid. (c) The general characters and classification of the metals, and the general methods of forming oxides and salts; the sources, the usual methods of extracting and the chief properties of the under-mentioned metals, also the modes of preparation, properties, adulterations and contaminations of their principal compounds: Potassium, sodium, lithium, barium, strontium, calcium, magnesium, zinc, aluminium, iron, chromium, manganese, nickel, cobalt, arsenic, antimony, tin, copper, bismuth, lead, silver, mercury, gold and platinum. (d) Carbon, its oxides, methane, ethylene and acetylene. The candidate will also be expected to possess a general knowledge of the methods of estimating carbon, hydrogen, oxygen and nitrogen in organic compounds, and of obtaining molecular formulas. The candidate is expected to solve simple problems relating to the weight and volume under different conditions of temperature and pressure of elements and compounds concerned in chemical reactions.



Educational Information



Practical Examination.—To exhibit a practical acquaintance with the methods of preparing the more important inorganic substances. To identify by chemical tests the more important non-metallic elements and their compounds, as well as the metals and salts indicated in the foregoing list. To analyse a mixture containing not more than two basic and two inorganic acid radicles. To understand the principles of volumetric analysis, and to prepare and standardise, and use volumetric solutions of inorganic acids, salts, alkalis, potassium permanganate and silver nitrate. The candidate will be required to bring to the practical examination his original laboratory note-books for inspection should the examiners so desire.

Pharmacopœial work is now included in pharmacy, under the title of "Pharmaceutical Chemistry." It leaves this subject free to be studied in harmony with other science studies. Chemistry is the study of the laboratory; it means practical work. Text-books are formidable things unless some attempt is made to get at grips with the subject from the synthetic point of view. Analysis compels the student to practical work; there is no other way, but synthesis is easily shirked, and, after all, experimental quantities will give a student the confidence which all the text-books in the world cannot give. The theoretical portions require the cultivation of the imagination. The student who can visualise the construction of the various formulas and reactions is never at a loss. One vital point should be made here: let every student write out the equation for every chemical reaction he has performed, not once only, but every time he may do it. Familiarity in writing out equations is a rare thing in examinees, and nothing—apart from practical work—impresses the mind more clearly than working and writing out equations. The change of hours should be noted. 300 hours in the abbreviated course of study is too long, but present registered students may still follow out this course until June 1, 1929. The schools will most probably adopt the rational one in the revised syllabus of 200 hours minimum, and allocate the spare hours saved to more adequate study of physics and botany as provided in the revision. A point which is frequently neglected by students in their early studies is conscientiously to keep note-books of the work they do at college. Where a candidate is weak in the practical paper it is a great help to him if the examiner can see for himself that systematic and careful work has been done.

PHYSICS

Candidates are required to possess an elementary knowledge of:—

(a) Units; mass; weight; the balance, force, energy and work; levers and pulleys; gravity; centre of gravity; distinctions between solids, liquids and gases; transmission of pressure in liquids; water-pumps; the syphon; Boyle's law; atmospheric pressure; barometers; air-pumps; diffusion; dialysis; specific gravity; vapour density.

(b) Temperature; thermometry; changes in volume of solids, liquids and gases with alterations of temperature; quantity of heat; specific heat; change of state; latent heat; boiling and freezing points; vapour pressure.

(c) Propagation of light; laws of reflection and refraction; photometry; simple properties of mirrors, lenses and prisms; the eye as an optical instrument; the principles of the correction of errors of vision by means of lenses.

(d) Simple properties of magnets; simple phenomena of static electricity; electric currents; primary and secondary cells; the magnetic, chemical and heating effects of currents; Ohm's law.

Practical Examination.—To perform simple experiments, solve simple problems and to show a knowledge of the construction and use of physical apparatus, so as to illustrate the subjects detailed above. The candidates' laboratory note-books may also be required.

The instructions speak of "elementary knowledge," but it means more than that. A formidable array of apparatus is always presented to the candidate, and unless practical familiarity has been obtained the candidate will find this a difficult and technical test in a viva voce examination. Failures are not so common as one might expect, but there are many weak, and it should not be forgotten that a double reference back

on account of weakness means a failure. While the course of study under the old conditions applying to students at present registered provides for only 60 hours, the new one is 120, which will give the candidate a better chance to obtain a real acquaintance with the subject. This is one of the improvements made to help the student. A written and practical examination will be introduced in 1929.

The First Day.—We keep the term "first day," as it still applies to present registered students. The above subjects include the first day's examination. Candidates must secure a pass in all three subjects; there is no question of aggregation. If a candidate passes in two subjects and fails in one, he or she may be referred in that one subject only, but failure in two means taking the three subjects again. In any case, no candidate can proceed to Part II until a complete pass has been secured in each subject in Part I.

EXTERNAL EXAMINATIONS IN PHARMACY

Apart from the examinations of the Pharmaceutical Society's examiners as set out in the above syllabus, there is a proviso for the acceptance of certificates in lieu of the Preliminary Scientific. At present the specification is vague, since no schools are approved and certificates are considered on their merits. They are: (1) The Final or Intermediate examination of any University in England and Wales, or equivalent examination in a Scottish University approved by the Pharmaceutical Council. (2) The Higher School Certificate examination conducted by an examining body approved by the Board of Education for subjects taken as principal subjects. The fee on acceptance of these certificates is £2 2s., and subsequently the same regulations apply as to the Pharmaceutical Society's examinations.

Qualifying Examination

PHARMACOGNOSY

(A written paper will be introduced after August 1, 1929.)

To recognise specimens of crude drugs mentioned in the British Pharmacopœia or in the annexed list; to be acquainted with their botanical, zoological and geographical sources, commercial varieties, the natural orders to which they belong, and the mode of collection and preparation for the market; to indicate the morphological nature of such as are organised, and the mode of formation of such as are unorganised; to describe them correctly, and to point out diagnostic characters either chemical or physical, the latter so far as they can be ascertained by the use of a lens. To name the chief active constituents of official drugs, to know the proportion present in good samples of the more important of them, and to possess a practical knowledge of any pharmacopœial tests or processes of assay applied to crude drugs or their official products.

Agar-agar	Elaterium	Pilocarpi micro-
Alkannæ Radix	Eucalypti Folia	phylli Folia
Altheæ Radix	Euphorbium	Pimenta
Amomi Meleguetæ	Fœni-græci	Piper longum
Semina	Semina	Piper nigrum
Arecae Semina	Fucus vesiculosus	Pix Burgundica
Arnica Rhizoma	Galbanum	Quercus Cortex
Cacao Semina	Guarana	Rhamni Frangulæ
Calendulæ Flores	Guttapercha	Cortex
Cambogia	Hellebori nigri	Sabinæ Cacumina
Canellæ Cortex	Rhizoma	Sandaraca
Cantharis	Hyoscyami Semina	Sanguinariæ
Cassia Cortex	Ignatii Semina	Rhizoma
Cetraria Islandica	Inulæ Radix	Sanguis Draconis
Chondrus crispus	Iridis Rhizoma	Sarsæ Radix
Chrysanthemi	Lacca	Scammonium
cinerariæfolii	Lauri Fructus	Sinapis Albæ
Flores	Lupulus	Semina
Cimicifugæ	Lycepodium	Sinapis Nigræ
Rhizoma	Manna	Semina
Cocæ Folia	Mastiche	Stramonii Semina
Cocculus Indicus	Moschus	Sumbul Radix
Conii Fructus	Mylabris	Tonco Semina
Convallariæ Flores	Olibanum	Ulmī fulvæ Cortex
Crocus	Papaveris Capsulæ	Vanillæ Fructus
Cumini Fructus	Physostigmatis	Veratri albi
Cydoniæ Semina	Semina	Rhizoma

Educational Information

The candidate is also required to recognise any of the plants in the following list:—

Aconitum Napellus	Digitalis purpurea	Pinus sylvestris
Althaea officinalis	Dryopteris Filix-mas	Prunus Laurocerasus
Anthemis nobilis	Foeniculum capillaceum	Quercus Robur
Atropa Bella donna	Hordeum distichon	Ros. canina
Avena sativa	Hyoscyamus niger	Rosmarinus officinalis
Brassica alba	Juniperus communis	Ruta graveolens
Brassica sinapioides	Juniperus Sabina	Salix alba
Bryonia dioica	Lavandula vera	Sambucus nigra
Cochlearia	Matricaria	Solanum Dulcamara
Aarmoracia	Chamomilla	Taraxacum officinale
Colechicum autumnale	Mentha pipéríta	Taxus baccata
Conium maculatum	Mentha Pulegium	Triticum vulgare
Cytisus Scoparius	Mentha viridis	Ulmus campestris
Daphne Laureola	Oenanthe crocata	Valeriana officinalis
Daphne Mezereum	Papaver Rhoëas	
Datura Stramonium	Papaver somniferum	

Students have not many opportunities of handling crude drugs before college begins, but every chance should be seized for a first-hand acquaintance. The colleges are well equipped with specimens of drugs which are usually selected, and the same applies to those in the Examination Hall; but commercial specimens require attention. It is not a bad plan to make a collection for oneself during pupilage, as it increases the interest immensely. Observation and memory play an important part, and frequent contact with specimens materially helps to fix style and form in the mind. The failure percentage is comparatively low, and it must be confessed they mostly arise from being too casual in looking at the specimens when shown them, giving random answers, and paying the penalty. Geographical sources of drugs are often difficult to memorise, but an atlas duly marked helps to make visual the various sources.

PHARMACY

(A written paper will be introduced after August 1, 1929.)

1. Pharmacy (General)—

(a) Operations requiring the use of heat. Evaporation, with particular reference to the preparation of extracts; special characters and modes of preparing the various classes of extracts; influence of surface, temperature, and pressure upon the rate of evaporation; water, steam and sand baths, distillation, ordinary, fractional, steam, and destructive, distinctive characters and objects of each; official preparations illustrating the various kinds of distillation, apparatus employed, the retort and receiver still and worm. Liebig's condenser, principles on which they are constructed and used. The principles of sterilisation. Sublimation; its objects and applications in pharmacy: official products of sublimation, calcination, and fusion. Desiccation; temperature best suited for drying particular drugs, loss in drying vegetable drugs, forms of drying ovens, principles on which they are constructed and used. (b) Disintegration of solid substances; cutting, bruising, and pulverisation, apparatus employed, principles indicating which is to be adopted in particular instances;

methods for controlling the degree of comminution, sieves and sifting, trituration, levigation, elutriation, granulation, including methods for producing certain chemicals as fine powders, small crystals, scales, etc. Filtration objects and methods, filtering media, means of expediting filtration; dialysis, its application in pharmacy, construction and use of the dialyser. Expression; methods of obtaining the juices from plants; recovery of the residual liquids from tincture marcs, etc., screw, hydraulic and other presses. Solution: its nature, solvent power of various menstrua, influences of (a) temperature; (b) state of division of the substance to be dissolved; (c) time; (d) position of the substance in the menstruum; Lixiviation, infusion, digestion, and decoction; maceration, percolation, and displacement, principles on which the successful performance of these processes depends; form and materials for percolators and other vessels employed. The principles involved in the dispensing of medicines, particularly with reference to the best excipients and methods for forming pill masses, the preparation and nature of emulsions, the most suitable emulsifying agents, and the best means of suspending insoluble substances in liquids. The candidate is also

required to show a general knowledge of the processes, and understand the principles of the processes by which official galenical preparations are made, and the principles on which they are based.

The candidate will be required to read without abbreviation autograph Latin prescriptions, translate them into English, understand the grammatical construction, and render a literal as well as an appropriate translation of the directions for use; to detect errors, discover unusual doses, and have a general knowledge of posology; to calculate percentages and other quantities occurring in prescriptions.

II. Practical Pharmacy and Dispensing.—To perform such operations of the British Pharmacopœia, or such parts of them as may be practicable, involved in the processes for preparing collodions, confections, decoctions, dilute acids, extracts (solid and liquid), glycerins, infusions, juices, liniments, lotions, mixtures, ointments, pill masses, plasters, powders (simple and compound), scale preparations, solutions, spirits, suppositories, syrups, tinctures, vinegars, waters and wines.

To compound and dispense medicines as prescribed; to write the directions in concise language and in a neat and distinct handwriting; to finish and properly direct each package, and to bring original laboratory note-book.

Attention may be called to "the candidate is also required to show a general knowledge of processes and understand the principles of the processes by which official galenical preparations are made and the principles on which they are based." Practical work as demonstrated in the note-books is the surest way to impress the mind of the examiner that a candidate understands how things are done. Present registered students may still train with an aggregate of 600 hours in pharmacy and practical pharmacy; but the only method arising from the last two years has been to treat pharmacy and pharmaceutical chemistry as separate entities and in the revised syllabus this is put into effect for guidance, and the

Syllabus for Chemist & Druggist Examinations

(IN BRIEF)

Preliminary Scientific

BOTANY

Morphology, including Anatomical Structure; Physiology, Reproduction; Physical Effects of Light and Gravity, classification, dissection and description of plants within specified classes.

CHEMISTRY

Chemical Principles; Non-Metals and their Compounds; Characters and Classification of Metals; Formation of Oxides and Salts; Carbon and its Oxides; Knowledge of Estimation of Carbon; Hydrogen, Nitrogen; Simple Chemical Problems.

PRACTICAL CHEMISTRY

Analysis of a salt containing not more than two Metals and two Acid Radicals; Identification and Knowledge of specified metals and salts; Principles of Volumetric Analysis and standardization of solutions.

PHYSICS

Conservation of Energy; Gravitation, Balance, Pressures; Diffusion, Vapour Densities; Thermometer, Barometer; Specific Gravity. Mass, Force, Energy, Work; Forms of Matter; Temperature and Pressures; Light: Reflection and Refraction; Correction of Vision; Magnets; Static and Current Electricity; Primary and Secondary Cells.

Qualifying

PHARMACOGNOSY

Pharmacopœial Drugs and others specified; Recognition, Classification; Sources, Structure, Chemical and Physical Characteristics; Active Principles.

PHARMACY

Laboratory Methods and Appliances; Preparation and Production of Galenicals; Knowledge of Assay; Sterilisation; Dispensing and Prescription Reading and Translation.

PHARMACEUTICAL CHEMISTRY

Preparation and properties of specified medicinal organic compounds. Pharmacopœial test for impurities, assay, and volumetric determinations.

FORENSIC PHARMACY

Knowledge of Schedules, Conditions and Precautions of Sale of Poisons.

Educational Information

hours divided—300 for pharmacy and 300 for pharmaceutical chemistry, though schools may still sign up for 600 hours until June 1, 1929; but it is much more probable that the change to the revised form will take place at once, as it is the result of practical experience.

PHARMACEUTICAL CHEMISTRY

(This examination is oral and practical, the former being replaced by a written one in 1929.)

To have a general knowledge of the preparation, principal properties, and reactions of the following: Hydrocyanic acid, cyanides, ferrocyanides, ferricyanides, oxalic acid, methyl and ethyl alcohols, acetone, formic and acetic aldehydes and acids, chloral hydrate, chloroform, iodoform, ether, ethyl acetate, acetamide, aloin, oleic acids, soaps, glycerin, lactic acid, citric and tartaric acids, sucrose, dextrose, lactose, starch, salicin, urea, simple urethanes, and ureides. Benzene, phenol, picric acid, phenolphthalein, nitro-benzene, aniline, acetanilide, benzoic acid, salicylic acid, acetylsalicylic acid, salol, gallic acid, tannic acid.

To have a general knowledge of the adulterations and contaminations which may occur in the elements and inorganic compounds included in the British Pharmacopœia, and such of the organic compounds mentioned above as are included in the British Pharmacopœia, and the methods by which the purity of these substances is determined.

Practical Examination

To identify by chemical tests the following organic compounds: Cyanides, oxalates, acetates, tartrates, citrates, benzoates, salicylates, starch, sucrose, dextrose, lactose, salicin, cocaine, quinine, morphine, strychnine, and their salts; methyl alcohol, ethyl alcohol, acetone, formaldehyde, glycerin, chloroform, phenol. To detect and identify the adulterations and contaminations which may occur in the elements and inorganic compounds included in the British Pharmacopœia and in such of the organic compounds mentioned in the list of substances for identification as are included in the British Pharmacopœia. To perform those volumetric determinations and those requiring the use of a nitrometer which are described in the British Pharmacopœia. To have a practical acquaintance with the methods of preparing the more important inorganic substances, and also the following organic compounds: Ether, chloroform, ethyl nitrite, hydrocyanic acid, acetanilide and nitro-benzene, so that he may be able to explain to the examiner the operations involved in their preparations, and, if called upon, to perform the operations or certain stages of them himself.

To determine quantitatively the total alkaloids in cinchona bark and its official preparations, in the liquid extract of belladonna and its preparations, and in the liquid extract of ipecacuanha; also the strychnine in the extract, liquid extract, and tincture of nux vomica; the morphine in opium and its extract, liquid extract and tincture, any of the above alkaloids in any other preparations by methods involving principles similar to the above, and the resin in tincture of jalap.

Candidates may consult the British Pharmacopœia and the British Pharmaceutical Codex.

The candidate will be required to bring to the practical examination his original laboratory note-books for inspection should the examiners so desire.

This subject appears to be the most unsatisfactory one at the present time. Papers are set on the estimations of the Pharmacopœia by pharmacy examiners when the subject appears to call for more chemical knowledge. As the viva voce must largely arise out of the practical work done, it would be an advantage to have a chemical examiner rather than one appointed on account of his ability and knowledge in pharmacy and dispensing. Many failures arise in this section, and from inquiries it does appear that the change over of chemistry of the Pharmacopœia from chemistry alone has left something to be desired. The number of days required make it very difficult to set equitable papers from purely volumetric work in the Pharmacopœia. If reform is needed, and it would be difficult to say it is not, it should take place in systematising this subject, which would get better work out of the students and be more satisfactory to the examiners.

FORENSIC PHARMACY

The candidate will be required: To enumerate the poisons contained in the Schedule to the Poisons and Pharmacy Act, 1908, viz.: Poisons within Part I of the Schedule; Poisons within Part II of the Schedule. To describe the conditions required upon the keeping, selling and dispensing of poisons, both in Part I and Part II of the Schedule; and to write the proper entry required, according to Schedule F of the Pharmacy Act, 1868, for the sale of a poison coming within Part I of the Poisons Schedule. To state the conditions imposed on the sale of scheduled poisons by wholesale and for export, and upon the sale of a scheduled poison when forming an ingredient in a medicine dispensed. To state the conditions applicable to the sale of poisonous substances. To explain the conditions imposed on the sale of arsenic by the Arsenic Act. To have a general knowledge of the requirements of the Dangerous Drugs Acts and Regulations as they affect the pharmacist.

Students in London still continue to be referred in the poisons law, and are likely to continue to be referred unless they take the subject more seriously. It comes largely from shop experience, and attention to the only available material in the Poison Cards mentioned below. The text of the Dangerous Drugs Acts has been printed in the *C. & D.*, but the student is advised to study the *C. & D. Poisons Cards No. 4* and *No. 2*, the latter illustrating the Labelling of Poisons Order, 1924. The Poisons Schedule (Poisons and Pharmacy Act) was printed in the *C. & D.*, I, 1925, p. 509, and a subsequent amendment appeared in the issue of July 17, 1926 (p. 127). Particulars as to conditions to be observed on the sale of scheduled poisons in the United Kingdom are given in the *C. & D. Diary*, 1925. The main difficulty about the poisons law is the absence of a book adequately dealing with the subject in non-legal language. The *C. & D. Diary*, 1922, gives a list of poisons the sale of which is controlled, and a summary of the pharmacy laws. These are also given on *C. & D. Poisons Cards Nos. 1 and 2*. These cards are sold at the uniform price of 1s. each, post free. Reference should be made to the various analyses of the Dangerous Drugs and Poisons (Amendment) Act, 1923, particularly as regards Section 17 of the Pharmacy Act, 1868. The Act referred to was printed in the *C. & D.*, I, 1923, p. 764, and editorial articles in that and subsequent issues explained the changes that had been made in the law. While it would be unreasonable to expect candidates to give a satisfactory account of the intricacies of poisons and pharmacy law, it is just as well to be aware of the places where there are pitfalls, since examiners may ask questions, and it is satisfying to show that intelligence has been applied to the interpretation of a very tricky and opinionative subject. Any student basing his reading and knowledge on the information referred to cannot fail to satisfy the examiners in poisons law.

The Pharmaceutical Chemist Examination

NEW REGULATIONS.—POINTS TO BE REMEMBERED

1. All students now entering in pharmacy must be duly articulated as apprentices.
2. Preliminary Scientific (or first part, science examination) may be taken on present collegiate hours until June 1, 1929.
3. The fee for Qualifying examination (£12 12s.) shall be deemed to include the Preliminary Scientific until August 1, 1929.
4. A chemist and druggist may proceed to pharmaceutical chemist qualification on old regulations up to July 1928, providing he was registered as a chemist and druggist before November 1, 1926.
5. The Entrance examination and Preliminary Scientific dates and conditions apply equally to Pharmaceutical Chemist qualification.

A person who was registered as a chemist and druggist before November 1, 1926, is entitled to enter for the Major examination under the syllabus in force up to that date; but this concession expires at the July examination, 1928. The old syllabus is an extension of the qualifying one for the chemist and druggist,

Educational Information

and is best taken as a continuation of studies. Several public institutions require it for their chief officer, but, generally speaking, the average man or woman takes it because of the knowledge that there is a higher standard than the Qualifying examination, and without it they would scarcely be happy.

The last of the old examinations will be held in April and July in London and Edinburgh.

Summary of Examination Fees

Apart from the fees for collegiate courses, the following are payable by pharmacy students:—

Registration as student, £2 2s.

Preliminary Scientific, £6 6s.

Re-examination in case of failure, £4 4s.; a person who has failed to attend, £2 2s.

Chemist and Druggist Qualifying examination, £12 12s.

Re-examination in case of failure, £4 4s.; a person who has failed to attend, £3 3s.

The fee for a person who enters before August 1, 1929, is £12 12s., which shall be deemed to include that of the Preliminary Scientific examination.

Major examination, £3 3s.

Those about to enter the calling should be informed as to the conditions for a chemist and druggist qualification, and, under competent advice, parents and guardians should weigh carefully the advantages and disadvantages of the new method of procedure. The conditions of the chemist and druggist qualification are dealt with under the appropriate heading. Two methods are possible for the pharmaceutical chemist qualification, one through the examinations of the Pharmaceutical Society and the other through the University of London or any other University which may later be recognised. The University training and examinations include both internal and external students.

In the case of the Pharmaceutical Society, there is no change in the times of the examination. The entrance examinations are the same for those of the Chemist and Druggist qualification, and the same applies to the Preliminary Scientific. At this point a decision must be made, though provision is made for the passing from that of a chemist and druggist to a pharmaceutical chemist qualification if it comes as an afterthought. A candidate must be twenty-one years of age and supply the usual proofs. The hours in an open shop or recognised institution are 2,000. The hours for studying at college are 1,600, made up by 620 in pharmacy, 270 in pharmacognosy, 440 in chemistry, and 270 in botany. The examination is in botany, chemistry, pharmacognosy, pharmacy (including the translation and dispensing of Latin prescriptions) and forensic pharmacy. The conditions of failure are the same as in the other examination, with this addition: If the standard required for the pharmaceutical chemist qualification is not reached, but the work done, in the opinion of the board of examiners, reaches the chemist and druggist standard, a certificate for that qualification may be awarded. A chemist and druggist who desires to go further will be entitled to enter for the pharmaceutical chemist qualification on an additional curriculum of 1,060 hours, including 240 in pharmacy, 110 in pharmacognosy, 420 in chemistry, and 290 in botany; but he will be excused the examination relating to translation and dispensing of prescriptions and forensic pharmacy. Articles of pupilage apply equally to students for the pharmaceutical qualification, the hours being 2,000. The syllabus is as follows:—

APPENDIX 5

SYLLABUS FOR THE PHARMACEUTICAL CHEMIST QUALIFYING EXAMINATION

Although the study of French and German is not included in the systematic course of instruction required by Regulation 25 (b) of the Regulations for the Pharmaceutical

*Chemist Qualifying Examination, questions will be set involving (1) the translation of passages in French and in German, and (2) answers with regard to the subject matter thereof.**

BOTANY

consists of two Papers and a Practical Examination. (1) The principles of morphology: the special morphology of medicinal plants. (2) Anatomy and histology: the systematic anatomy of medicinal plants; microchemistry. (3) The distinguishing characters of the chief taxonomic divisions of plants, including the following groups and families, particular attention being directed to such plants as are of pharmacognostical importance:—

THALLOPHYTA.

Algae:—Cyanophyceæ, Chlorophyceæ, Diatomaceæ, Phæophyceæ, Rhodophyceæ.

Fungi:—Phycomycetes, Ascomycetes, Basidiomycetes, Lichenes, Bacteria.

PTERIDOPHYTA.

Lycopodiina:—Lycopodiaceæ.

Filicina:—Polypodiaceæ.

Equisetina.

SPERMATOPHYTA.

Gymnospermæ:—Coniferæ.

Angiospermæ.

Monocotyledones:—Graminaceæ, Araceæ, Liliaceæ, Amaryllidaceæ, Iridaceæ.

Dicotyledones:—Salicaceæ, Fagaceæ, Ulmaceæ, Cannabaceæ (= Cannaboideæ), Polygonaceæ, Ranunculaceæ, Papaveraceæ, Cruciferae, Rosaceæ, Leguminosæ, Rutaceæ, Euphorbiaceæ, Malvaceæ, Myrtaceæ, Umbelliferae, Ericaceæ, Gentianaceæ, Boraginaceæ, Labiatae, Solanaceæ, Scrophulariaceæ, Rubiaceæ, Caprifoliaceæ, Valerianaceæ, Campanulaceæ, Compositæ.

(4) The general Principles of Plant Physiology with special reference to the processes of metabolism.

Practical Examination

To (1) examine, describe, dissect and make preparations, both macroscopic and microscopic, of plants or parts of plants included in the foregoing schedule; (2) refer to their appropriate systematic position plants or parts of plants comprised in the foregoing schedule; (3) identify British angiosperms by means of a flora; show a practical knowledge of the methods and apparatus used for demonstrating the main facts of the physiology of plants.

CHEMISTRY

consists of two Papers and a Practical Examination.

To have a general acquaintance with the five main divisions of the subject, viz.:—

(1) General Theoretical Chemistry; (2) Inorganic Chemistry; (3) Organic Chemistry; (4) Physical Chemistry; (5) History of Chemistry since the time of Boyle.

The candidate will be allowed to bring into the examination laboratory any one book on quantitative analysis provided that it does not contain any reference to qualitative analysis.

PHARMACOGNOSY

consists of two Papers and a Practical Examination.

To possess a general knowledge of the crude drugs of vegetable or animal origin described in the British Pharmacopœia, of their more important constituents and of their chief commercial varieties; to be acquainted with the methods commonly adopted in the microscopical examination of vegetable drugs, including the isolation and identification of the various tissues and cells; measurement; microchemical tests; and the means of examining fabrics used for surgical dressings.

Practical Examination

The candidate will be required to identify any crude drug of vegetable or animal origin described in the British Pharmacopœia; to demonstrate diagnostic characters ascertainable by means of a lens, or by dissection; to make, sketch and describe microscopical preparations of any organised vegetable drug contained in the British Pharmacopœia,

* Candidates are recommended to read some books or papers in French and in German on the subjects of the examination. In all subjects the candidate is required to bring the original laboratory books signed by the teacher, which may show any original work done.

Educational Information

either in the entire or powdered state; to point out distinctive histological characters in the same; to identify in the form of powder such as are commonly used in that condition, and to ascertain their freedom from admixture by comparison with authentic material.

PHARMACY

To show a general knowledge of the following, and a practical acquaintance with pharmaceutical apparatus and operations:—

Solution and the conditions affecting it; methods of determining solubility, the preparation of isotonic, colloidal and other solutions. Filtration, colation, clarification and decolorisation. Preparations of crystals and granules. Dialysis. Apparatus used and principles involved in the drying, disintegrating, powdering and sifting of crude drugs and in the processes of evaporation, distillation, sublimation, calcination and fusion; the application of these processes in pharmacy. Expression; recovery of residual liquids from tincture marcs. The principles of sterilisation; sterilisation of apparatus and materials. Preparation of aseptic and antiseptic dressings; determination of the proportion of wool and cotton in dressings made from the mixed fibres. Enzymes and their action in the manufacture and preservation of pharmaceutical preparations. An elementary knowledge of vaccines and serums and the methods by which they are prepared and standardised.

To possess a general knowledge of the chemistry of the organic and inorganic substances or compounds of the British Pharmacopœia, and also a general knowledge of the manufacture of the preparations of the British Pharmacopœia.

Practical Examination

To conduct the operations by which the preparations of the British Pharmacopœia are made; to dispense prescriptions, and to have a general knowledge of posology.

Qualitative and quantitative analysis with special reference to the tests and assay processes of the British Pharmacopœia by which the purity of chemical drugs is ascertained and by which the principal constituents of vegetable drugs and their preparations are determined.

FORENSIC PHARMACY

This is the same as set forth in the Chemist and Druggist qualifications.

University Examinations in Pharmacy

LONDON

In order to be admitted to a degree of B.Pharm., London, either as an internal or external student, candidates must (1) matriculate in one of the ways provided by the regulations, (2) pass the Intermediate examination in science, (3) have followed an approved course of study under recognised teachers of the University and in approved institutions. In order to be entered on the Pharmaceutical Register they must, in addition, have been apprenticed for 2,000 hours under accepted articles of pupilage and have passed the examination of the Society in forensic pharmacy. The fee for each examination is £6 6s. Application for copies of the regulations should be made to the Academic Registrar, University of London, South Kensington, S.W.7, or for an external student to the External Registrar.

The lay-out of the hours in the course of study for B.Ph. are the same as the Pharmaceutical Chemist Final, but in the Intermediate the examination differs, and the lay-out varies too.

The Intermediate examination of the University for external and internal students is set in two papers and a "practical" in each subject. Chemistry includes methods which lead to the discovery of the composition of common natural materials; determinations of molecular weights, chemical laws and processes. In the practical: Quantitative, gravimetric, and volumetric work. Note-books must be available for inspection by the examiners.

In physics: The properties of solids, liquids and gases; principles of heat, sound and light, and the properties of magnetism and electricity.

Botany: Characteristics of angiosperms, gymnosperms, and specified natural orders. Pteridophyta, bryophyta, algae and fungi, together with elementary physiology. In

the practical will be included dissection and examination of parts of plants.

Zoology: The fundamental facts and laws, including specified types. General organisation of types, biological laws, structural phenomena, reproduction and diagnostic characteristics of lower forms of life. In the practical: Parts of the animals selected will require description, and some dissection is expected.

Biology: This is an alternative subject to zoology. It includes the differences between living and non-living matter; cells, integration, differentiation and division of labour. Enzyme action, transformation of energy in living matter; nutrition, stimulus, response, movement, chemical co-ordination and general mechanisms. Reproduction; embryo, and heredity. In the practical: Appropriate physiological experiments, dissection, microscopy and elementary embryology.

The B.Pharm. degree Final examination is the same for external as well as internal students, covering botany, chemistry, pharmacognosy, and pharmacy, and is set out in the syllabus for the Pharmaceutical Chemist qualification, *minus* forensic pharmacy. The degree cannot be taken until three years after matriculation, and includes the specified hours under the Pharmaceutical Society's examination, and is held once a year. Many institutions are recognised for the Intermediate Science, and some additions have been made for the B.Pharm. degree. The list can be obtained from the Registrar.

A degree granted by the University does not entitle to registration by the Pharmaceutical Society, but regulation 29 provides that any registered apprentice or student who has served the period of practical training and produces to the Registrar a notification of having passed the Final examination for the degree of bachelor of pharmacy of the University of London, or a corresponding degree of any other University approved by the Pharmaceutical Society's Council, shall be deemed to have passed the Pharmaceutical Chemist Qualifying examination in the subjects set out on the final certificate, and shall be entitled to enter the examination of the Society in forensic pharmacy and, on passing, be entitled to registration.

MANCHESTER

Science degrees in pharmacy are conferred by the universities of Glasgow and Manchester. In Manchester, for the B.Sc. (Pharm.) degree, candidates must first pass the University Matriculation examination or its equivalent. They should then attend courses in chemistry, physics, botany and pharmacy, and present themselves for the Intermediate examination in the first three subjects at the end of the first year. Such candidates, before proceeding to the Final examination, must present certificates of having attended (1) during the second year courses in chemistry (advanced), botany (advanced), and pharmaceuticals; (2) during the third year further approved courses in chemistry or botany, and in pharmaceuticals (advanced); and (3) must present satisfactory evidence that they can read scientific literature in either French or German, or in any other language approved by the Faculty. They should present for the Final examination (i) chemistry or botany, (ii) pharmaceuticals. The lecturer in pharmacognosy, materia medica and practical pharmacy is Mr. James Grier, M.Sc., Ph.C. The cost of a degree course varies with the subjects chosen and with the nature of the degree, but the average fees for an ordinary B.Sc. degree course amount to £37 16s. a session. Full particulars may be obtained from the Pharmaceutical Department, University of Manchester.

GLASGOW

In Glasgow, candidates must first pass the Preliminary examination. In not less than three academic years they must attend at least seven courses of instruction, of which four must be taken in the University, and must have been "practically engaged in the operations of pharmacy." The regulations may be obtained from Jackson, Wylie & Co., 73 West George Street, Glasgow.

Educational Information

Schools of Pharmacy

Schools and institutions are recognised by the Pharmaceutical Society in most parts of Great Britain, some for Part I of the Chemist and Druggist Qualifying examination, and some for Parts I and II. The following are the principal schools and institutions in question.

ENGLAND AND WALES

LONDON

The School of Pharmacy

17 Bloomsbury Square, W.C. 1

Dean of School: Prof. H. G. Greenish, D.-ès-Sc. A course for Part II only of the Chemist and Druggist Qualifying examination commences October 1927, ending June 1928. Fee, £31 10s. The first and second year of a two-year's course in pharmacognosy and pharmacy (including pharmaceutical chemistry) for the Pharmaceutical Chemist Qualifying examination and for the degree of B.Pharm. of the University of London commences October 1927, ending June 1928. This course has been arranged with University College, and an inter-collegiate time table drawn up enabling botany and chemistry to be taken at University College and the other subjects at the Society's School. Fee for each year of the course, £44 2s. No course for Preliminary Scientific. Fees include full subscription to the Students' Association.

Birkbeck College

Bream's Buildings, Fetter Lane, E.C.4

Principal: George Senter, D.Sc. Recognised for Preliminary Scientific examination. Autumn term commences September. Evenings only.

Chelsea Polytechnic

Manresa Road, Chelsea, S.W.3

Day and evening courses for the examinations of the Pharmaceutical Society, Society of Apothecaries, and B.Pharm. degree University of London. Session begins September 21. Fees: Day courses £7 per term; evening courses £1 to £3 per session. Prospectus from Secretary.

Gordon Hall School of Pharmacy for Women

15 Gordon Square, W.C.1

Principals: Miss E. S. Hooper, B.Sc., F.I.C., Ph.C., and Miss K. M. King, Ph.C. Courses of training for the Qualifying examinations of the Pharmaceutical Society and Society of Apothecaries. Particulars from Principals.

London College of Pharmacy

361 Clapham Road, S.W.9

Staff: W. F. Gulliver, Ph.C. (Principal), I. G. Rankin, B.Sc., Ph.C., W. Gerrard, B.Sc. (Hons.), A.I.C., Miss A. B. Earle, Ph.C.. Complete courses extend over nine, six, and three months for Preliminary Scientific and Chemist and Druggist Qualifying examinations. Fee, £10 10s. per term. Evening classes, Monday, Wednesday and Thursday. From £1 1s. per term. Nine months' course for Apothecaries' Hall Dispensers' examination. Fee, £6 6s. per term. Botanical garden attached to school.

Norwood Technical Institute

Knight's Hill, West Norwood, S.E.27

Principal: L. N. Coombs, B.Sc. Day and Evening Classes for Preliminary Scientific examination. Staff: Chemistry and Physics, Dr. H. T. S. Britton, D.Sc., F.I.C.; Botany, Ethel R. Spratt, D.Sc. Session opens September 19. London fee, 15s. for full course.

The South of England College of Pharmacy

186 Clapham Road, S.W.9

Principal: H. Lucas, Ph.C., F.C.S. Staff: C. Beaven, Ph.C., M.P.S.; A. Pirnie, Ph.C., M.P.S.; G. Dodds, M.P.S., C. Kemplay, M.P.S. Nine months' course begins October 6, covering Preliminary Scientific and Chemist and Druggist Qualifying examinations. Fee,

£31 10s. Six months' courses for either part start October 7. Fee, £21. Classes daily 9.30 a.m. to 5 p.m. Evening classes for Chemist and Druggist and Pharmaceutical Chemist Qualifying examinations on October 10. Fees from £1 1s.

Wandsworth Technical Institute

High Street, Wandsworth, S.W.18

Evening classes in chemistry, physics and botany for Qualifying examination of Pharmaceutical Society. Fee, 15s. a session.

West Ham Municipal College

Principal: T. C. Baillie, M.A., D.Sc. Head of Chemistry Department: G. Dean, M.A., D.Sc. Pharmacy and Materia Medica: W. A. Knight, Ph.C. Evening course in pharmacy, materia medica and chemistry, commencing September 19. Fees: 14s. to 28s. per session.

Westminster College of Pharmacy

190 Clapham Road, London, S.W.9

Founder: G. S. V. Wills, Ph.C. Principal: P. H. Woodnoth, Ph.C., F.C.S., assisted by J. G. Everett, Ph.C., and D. W. A. Mitchell, M.P.S. Tuition for Preliminary Scientific and Qualifying examinations. Revision course of six weeks commenced on August 10. Fee, £6 6s. The 1927-28 session commences on October 5, and arrangements are made for revision, six and nine months' courses. Part-time classes for Preliminary Scientific and Chemist and Druggist Qualifying examinations are held and preliminary instruction by correspondence courses. Classes on Wednesday and Thursday evenings for Preliminary Scientific examination. Correspondence courses for preparatory work or revision. Fee, 10s. 6d. to £2 12s. 6d.

The Technical Institute, Wimbledon

Gladstone Road, S.W.19

Lecturers: R. S. Glennie, Ph.C., F.C.S., M.R.C.S., L.R.C.P.; F. B. Garner, B.Sc. (Hons.), A.I.C., F.C.S., A.R.C.Sc.; C. T. Archer, M.Sc., A.R.C.Sc. Classes for Preliminary Scientific examination. Session commences September 26.

Woolwich Polytechnic

Woolwich, S.E.18

Principal: A. F. Hogg, M.A., F.C.S. Head of Chemistry Department: G. Melland, M.Sc., A.R.S.M., F.I.C., F.C.S. Lecturers: J. G. Kettlewell, M.Sc.; S. Platt, B.Sc. Head of Physics Department: T. B. Vincomby, M.C., M.A. Lecturers: H. G. Robinson, B.Sc.; C. G. Forbes, B.Sc., A.R.C.Sc., D.I.C.; J. Poole, B.Sc. Evening classes only, 7.10 to 9.40 p.m. Fees: First evening, 20s.; second evening, 10s.; any additional evening, 5s., per session of 36 weeks. Recognised for chemistry, physics and botany in Preliminary Scientific examination.

PROVINCES

Accrington Technical School

Principal: J. P. Ackroyd, B.Sc. Staff: N. Booth, B.Sc., H. Ashworth. Science course each year occupies three evenings of two and a half hours each, one and a half hour being devoted to practical work. Three years' course. Fee: 7s. 6d. a year.

Barnsley Technical School

Principal: D. Paton Grubb, B.Sc. (Edin.). Chemistry Department: A. Price, B.Sc. (Lond.), F.I.C. Session from September 19, 1927, to July 7, 1928. Affiliated to University of Sheffield. Recognised for Preliminary Scientific examination. Part-time course for apprentices in district. Fee: £2 2s. the session. Evening instruction in chemistry and physics, and in botany on one afternoon a week. Fees: 12s. 6d. per course a session.

Barrow-in-Furness Technical College

Lecturers: Chemistry—T. Hopkins, Ph.D. (Lond.). Physics—D. W. Lloyd, B.Sc. Botany—Miss D. Fleet,

Educational Information

B.Sc. Evening classes in chemistry, September to April. Fees: 7s. 6d. to 10s. Day and evening courses for apprentices, September to July. Fees: Course, including chemistry, physics and botany, £3 3s.

Bath and West of England College of Chemistry and Pharmacy

Principal: David J. Williams, B.Sc., Ph.C., F.C.S., F.S.M.C. Staff: W. Cooper, Ph.C., F.S.M.C., F.B.O.A., A. H. Millard, Ph.C., G. H. Moore, M.P.S., F.I.O., R. Linton, G. Collins, F.S.M.C. Day classes in preparation for the examinations of the Pharmaceutical Society, the Apothecaries' Hall and others. Revision course from August 10. Full-time nine months' course; courses for Preliminary Scientific and Qualifying examinations and revision courses commence October 7. Correspondence courses for all above examinations and for scholarships.

Birmingham (Aston) Technical College

Principal: Charles A. White, M.Sc. Chemistry Lecturer: J. C. Hutton, B.Sc. Physics: W. B. Wynn, B.Sc. Fees: Part-time day, £1 to £1 10s. per session. Evening classes, ending March 31, 10s.; ending May 31, 12s. 6d. Recognised for chemistry and physics.

Birmingham Central Technical College

Principal: W. E. Sumpner, D.Sc. Head of Pharmacy Department: H. Berry, B.Sc., Ph.C. Courses for the following examinations commence on September 26. Preliminary Scientific, Chemist and Druggist Qualifying, Pharmaceutical Chemist Qualifying, Intermediate B. Pharm. (London), Final B. Ph. (London). Particulars on application to the College, Suffolk Street.

Birmingham (Handsworth) Technical College

Principal: W. E. Harrison, B.Sc. Physics: E. A. Lees, A.R.C.S., H. J. Roper, J. J. Allan, B.Sc. Chemistry: W. W. Sirman, B.Sc., W. H. Hardaker, M.Sc., B.Sc., L. G. Beresford, B.Sc. Botany: W. H. Hardaker, M.Sc., B.Sc. Recognised for Preliminary Scientific examination. Special courses for apprentices. Fees: Evening.—Chemistry, physics and botany, 12s. 6d. per session. Day.—One half-day per week, £1 per session; two half-days, £1 10s. per session; three half-days, £3 per session. Students under eighteen years of age, reduced fee of £1 per session for two half-days per week (additional half-days as above). Day classes fee includes admission to approved evening classes.

Blackburn Technical College

Head of College: W. Wilkinson, F.T.I. Head of Science Department: G. W. F. Holroyd, M.A., F.I.C., assisted by: Physics: A. H. Berry, M.Sc.; Botany: J. Ranson; Chemistry: J. Rhodes, B.Sc., Miss E. Holt, B.Sc., J. H. Stringfellow. Full-time day courses in chemistry, physics and botany, for Qualifying examination, also special classes for apprentices on three half-days per week. Syllabus for Qualifying examination covered in this course also. Fee: £1 per half-day per session.

Bolton Municipal Technical College

Head of Chemical Department: T. M. Nightingale, B.Sc. Chemistry: J. L. Whiteside, F.C.S., F. Smith, B.Sc., F. Slater, B.Sc., H. E. Buckley, M.Sc., J. Ball, B.Sc. Physics: J. W. Grime, B.Sc. Botany: Mrs. M. S. Burgess, B.Sc. Recognised for Preliminary Scientific examination. Course fees: 5s. to 10s. Non-Course fees: One or two evenings a week, from 7s. 6d. to 17s. 6d., as to year of study.

Bournemouth Municipal College

Principal: L. B. Benny, M.A. Lecturers.—Chemistry: F. E. Wilson, B.Sc.; A. S. White, B.Sc., Miss M. Penrose, B.Sc., E. Kilner, B.Sc. Botany: Miss H. V. Davies, B.Sc.; Mrs. D. E. Glass. Physics: R. M. Clark, B.Sc.; G. H. Hamilton, B.A., B.Sc.; T. T. Smith, B.Sc. Recognised for Preliminary Scientific examination. Day classes, fee, £6 6s. per term; reduced fees for part time. Evening classes, fee for grouped courses about £1 1s. per session of two terms. Session commences in September.

Bradford Technical College

Principal: Professor H. Richardson, M.Sc. Head of Pharmacy Department: F. J. Dyer, B.Sc., Ph.C. Assistant lecturer in *Materia Medica* and Pharmacy: J. W. Cooper, Ph.C. Full-time and part-time courses in chemistry and pharmacy for Preliminary Scientific, Chemist and Druggist and Pharmaceutical Chemist examination, and Apothecaries' Assistants examinations.

Brighton Technical College

Principal: W. Mansergh Varley, M.A., D.Sc., Ph.D., F.C.S.; Head of Pharmacy Department, H. B. Mackie, M.P.S., Ph.C., F.C.S. Session opens September 13, 1927. Systematic courses of instruction for Preliminary, Scientific, Chemist and Druggist and Pharmaceutical Chemist Qualifying examinations, and for B. Pharm. degree of London University. The Cripps Exhibition is tenable at this College. The "Edmund White" Medal is awarded annually. Prospectus from Chief Clerk, Technical College.

Bristol Merchant Venturers' Technical College

Chemistry Lecturer: W. A. Andrews, B.Sc. Assistant Lecturers, J. Ferguson, B.Sc., Ph.D., T. Malkin, B.Sc., Ph.D., A. Marsden, F.I.C., E. J. Riggs, B.Sc. Physics: G. Pugh, B.Sc. Botany: E. E. M. Beer, B.Sc. Recognised for Preliminary Scientific examination. Session commences in September. Fees: 7s. 6d. to 15s.

Cardiff Technical College

Principal: Charles Coles, B.Sc. Head of Pharmacy Department: Thomas Lewis, Ph.C., F.S.M.C. Lecturers in Pharmaceutics: J. M. Davies, Ph.C., L. L. Jones, Ph.C. Chemistry: H. W. Webb, M.Sc., F.I.C., E. A. Rudge, B.Sc., H. Aldred, M.Sc., P. H. Griffiths, B.Sc. Pharmaceutical Chemistry: H. A. Perkin, Ph.C. Physics: W. S. Vernon, M.Sc., J. Webber, B.Sc., F.S.M.C. Botany: J. Mangan, M.A., F.R.C.Sc. Nine-months' day course for Preliminary Scientific and Chemist and Druggist Qualifying examinations commence in October. Also two years' course for Pharmaceutical Chemist Qualifying examination, and three years' course for Degree in Pharmacy. Fee, £15 15s. Apothecaries' Hall Assistants' examination, nine-months' course. Fee, £15 15s. Pharmaceutical Chemist Qualifying examination. Fee: (October to July) £15 15s. Open scholarships offered annually for competition. Prospectuses on application to Principal.

Darlington Technical College

Principal: J. W. Angles, M.Sc. Chemistry: A. J. Bishop, B.Sc., and J. Watson, M.Sc. Evening pharmacy course. Fees: 15s. to 25s. Recognised for Preliminary Scientific examination.

Derby Technical College

Principal: D. S. Anderson, Ph.D. Lecturers.—Chemistry: J. Yates, M.Sc., F.I.C., G. E. Pool, B.Sc., F.I.C., E. A. Seeley, Ph.D., M.Sc. Physics: G. H. Broom, B.Sc., F. Record, B.Sc.; W. D. Jones, B.Sc. Botany: W. B. Randles, B.Sc. Pharmacy: H. J. Chown.

Courses arranged in day and evening classes. Fees: Day, £5 5s. per term; one half-day per week, 15s. per term; evening classes, £1 10s. per session. Recognised for Preliminary Scientific examination.

Dover Technical Institute

Lecturers.—Chemistry and Physics, A. B. Constable, M.A., B.Sc., Oxon; W. E. Pearce, B.Sc. Botany: T. E. Archer, B.A. (Cantab.). Chemistry, physics and botany courses especially intended for pharmaceutical students. Fee (evenings), 10s. 6d. for one or two subjects.

Exeter, University College of the South-West of England

Principal: W. H. Moberly, D.S.O., M.A. Chemistry: Professor W. H. Lewis, M.A., F.I.C., S. Glasstone, M.Sc.; D.Sc., A.I.C., Miss R. King, M.Sc. Physics: F. Newman, D.Sc., A.R.C.Sc., V. H. L. Searle, M.Sc. Botany: J. L. Sager, M.A. Courses include preparation for Part I of the Qualifying examination of the Pharma-

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ceutical Society. Fees, £18 18s. The course for the Chemist and Druggist Qualifying examination has been transferred to Plymouth Technical School.

Halifax Municipal Technical College

Principal: J. Crowther, B.Sc. Head of Chemistry Department: W. J. Stansfield, A.I.C. Lecturer in Botany: C. Fielding, Ph. C. Instruction (two seasons) for Preliminary Scientific examination. Afternoon and evening classes. Duration of session: September 12, 1927, to July 19, 1928. Fee, £1 1s. per session.

Harrogate Technical School

Principal: W. E. C. Jalland, M.Sc. Chemistry: W. Wallis, Inter. B.Sc. Physics: T. H. Lusher, B.Sc. Botany: A. O. J. Lupton, B.Sc. Recognised for Preliminary Scientific examination. Evening classes. Fees, 7s. 6d. for two to three subjects per session.

Huddersfield Technical College

Principal: J. F. Hudson, M.A., B.Sc. Full day and evening courses in subjects for Preliminary Scientific examination of the Pharmaceutical Society are held. Also part-time courses in pharmacy and materia medica. Fee: Full-time, £12 12s. a session; part-time course, £3 3s.

Hull Municipal Technical College

Head of Chemistry Department: Geo. E. Johnson, B.Sc., F.I.C., assisted by eight lecturers. Classes in inorganic and organic chemistry, physics, botany.

Kingston-upon-Thames Technical College.

Instructors: Mr. W. S. Burton, Ph.D., Mr. R. Atkin, M.A., M.Sc., Mr. F. W. G. Ridgewell, M.A., B.Sc., Mr. E. Card, B.Sc., Mrs. L. J. Howland, B.Sc. Full course in chemistry, physics and botany commences September 27. Fee for season: £1 10s. Prospectus from Principal.

Lancaster Technical School

Headmaster: F. H. Mould, B.Sc. Lecturers: S. Walton, B.Sc., P. Gillman, B.Sc., W. Knowles, B.Sc., J. Baty, B.Sc., Miss E. Richardson. Recognised for Preliminary Scientific examination. Apprentices may attend on Monday afternoons and several evenings per week. Fees, 11s. 6d. to 16s. 6d.

Leamington Technical School

Lecturers: Physics: F. W. Onslow, B.Sc.; Chemistry, C. T. Freeman, M.A.; Botany, Mr. K. Carruthers, M.A. Friday evening classes 7.30 to 9.30 p.m. Recognised for Part I of Qualifying examination. Physics Friday, chemistry Wednesday, botany Monday. Fee, 10s. per class.

Leeds College of Pharmacy

Principals: F. Pilkington Sargeant, Ph.C., F.C.S., A. W. Lupton, Ph.C., G. A. Nelson, F. Mort, R. Overend. Full-time course for Chemist and Druggist Qualifying examinations begins October 11, free £31 10s. Six months' course for Preliminary Scientific or Chemist and Druggist Qualifying examination, £21. Revision course from August 16, until September 25. Fee, £6 6s. Apothecaries' Hall course (nine months) £21, commence October 11. Laboratories have recently been rebuilt.

Leeds Technical College

Principal: J. H. Everett, B.Sc. Chemistry: R. Gawler, M.Sc., F.I.C., assisted by A. Taylor, M.Sc., H. E. Goodson, S. Parrish, B.Sc., M. S. Fox, B.Sc., R. A. Hobley B.Sc. Physics: J. Crosfill, B.Sc., L. Moore, M.Sc. Botany: Miss G. M. Redfern, M.Sc., Rev. H. Parish. Part-time day course in chemistry, physics, and botany for the Preliminary Scientific examination. Fee, £12 12s. for session. Evening course occupies three sessions. Preparatory course for the Preliminary examination. Fee, £1 1s. Full course for Apothecaries' Hall examination. Fee, £15 15s. Session commences September 13; evening, September 19. Special evening class in bacteriology for qualified chemists.

Leicester College of Technology

Chemistry: H. L. Long, B.Sc., A.I.C., G. Lawton, B.Sc., Ph.D., Miss D. Baylis, M.Sc., A.I.C. Pharmacy: F. W. Thompson, Ph.C. Head of Department, R. Clarke, B.Sc. Botany: H. M. Lacey, M.A., and Mrs. Lacey. Nine months' course; fee, £21; £14 for subjects in Preliminary Scientific or Chemist and Druggist Qualifying only. Part-time £4. Part-time course for the Pharmaceutical Chemist Qualifying examination. Students prepared for Assistants' examination of Society of Apothecaries. Course for apprentices and students for Preliminary examination. Commencing date, September 19.

Leicester, The Wyggeston Grammar School

Headmaster: T. Kingdom, M.A. Staff: Chemistry: Alwyn Pickles, M.Sc. (Lond.). Physics: E. C. Cowell, B.Sc. (Lond.), D.I.C. Botany: H. M. Lacey, M.A. (Cantab.). Recognised for Preliminary Scientific examination; three-term session from September to July. Fee, £15 15s. for the session.

Liverpool Municipal Technical School

Principal: J. Scholes Hague, M.Sc. Chemistry: A. E. Findley, B.Sc., F.I.C. Physics: S. S. Richardson, D.Sc. Botany: W. T. Mathias, B.Sc. Fees: (three afternoon or evening classes weekly), £1 to £2 as to course.

Liverpool School of Pharmacy

Principal: H. Humphreys Jones, A.I.C., Ph.C., F.C.S., assisted by J. Butler, B.Sc., F.I.C., W. E. Coates, B.Sc., Philip H. Jones, F.I.C., R. A. Williams, M.P.S., J. A. Wilson, Mrs. Butler. Fee, £66 6s. Autumn season October 6. Nine months' course. Fee, £31 10s. Six months' course for Preliminary Scientific examination. Fee, £21. Six months' course, Chemist and Druggist Qualifying examination. Fee, £21. Part-time classes on Tuesday evenings and Wednesday and Thursday afternoons and evenings, commencing October 5. Scholarships are offered.

Manchester School of Pharmacy

Principal: Harry Brindle, B.Sc. (Lond.), Ph.C. Next terms for Preliminary Scientific and Qualifying examinations commence on October 6. Six months' courses for Preliminary Scientific or Qualifying examinations, and a nine months' combined course for both. Revision course August 15. Early application is necessary.

Manchester College of Technology

Principal: B. Monat Jones, M.A. Lecturers: O. R. Howell, Ph.D., R. J. Hughes, B.Sc., W. Anderson, B.Sc., W. O. Howarth, M.Sc. Complete course for Preliminary Scientific Qualifying examination given jointly with Botanical Department of University. Session starts October 3. Course extends over two years, and is also intended to prepare students for the Manchester, Fairchild, and Leverhulme Scholarship Competitions held in June. Particulars on application to the Registrar. Fees: First and second years, £5 5s. per session, which commences October 3. Students enrolled September 26.

Manchester University

Lecturers in pharmaceuticals: Mr. James Grier, M.Sc., Ph.C., Miss Ivy Roberts, M.Sc., Ph.C., Miss J. Duncan, B.Sc., M.P.S. Courses for Chemist and Druggist and Pharmaceutical Chemist Qualifying examinations in Pharmaceutical Department commence in October and continue for six to nine months, composition-fees being £23 2s. and £31 10s. respectively. Part-time (afternoon and evening) courses, extending over two years, have also been arranged for Preliminary Scientific examination at College of Technology; fee, £10 10s. Degree courses in pharmacy are available. Special courses include bacteriology for senior students.

Newcastle-on-Tyne, Armstrong College

Pharmacy students admitted to classes in chemistry, physics and botany. Fees, £25-£30 per annum, according to the classes taken, registration fee, subscription

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to students' societies and university union, amounting to £5 13s. 6d. per annum.

Newport (Mon.) Technical College and Institute

Principal: G. R. Bennett, B.Sc., M.B.E. Lecturers: Chemistry and Botany, A. Brennan, B.Sc., H. Rowland, B.Sc. Fees: Evening, £1 11s. 6d. for session; part-time day, £3 3s. for session.

Nerwich Municipal Technical Institute

Principal: Hugh Ramage, M.A., F.R.C.Sc.I. Chemistry: W. W. Reed, M.Sc. Physics: D. O. S. Davies, B.Sc. Botany: P. P. F. Looker. Recognised for Preliminary Scientific examination. Combined day and evening courses. Session opens September 12. Fees: £1 to £1 10s. per session.

Nottingham University College

Principal: Professor W. H. Heaton, M.A. Pharmacy Department: Director, A. O. Bentley, Ph.C. Pharmaceutical Chemistry: J. E. Driver, M.Sc. Pharmacognosy: G. E. Trease, Ph.C. Full-time day course (nine months) for Chemist and Druggist Qualifying examination. Fee, £30. Two years' course for B. Pharm. Degree and Pharmaceutical Chemist examinations. Fee, £33 15s. Also part-time courses for Preliminary Scientific examinations. Fee, £9 9s. Prospectus will be sent free on application to the Registrar. Next session begins September 30.

Plymouth and Devonport Technical College

Principal: W. S. Templeton, M.A., B.Sc. Physics: The Principal, F. C. Marks, B.Sc. G. H. Lock. Chemistry: R. R. Butler, M.Sc., A.I.C., F.C.S., T. Thorne Barnes, B.Sc. Materia Medica and Pharmacy: A. H. Ware, Ph.C. Part-time courses for Preliminary Scientific Qualification held three afternoons or evenings each week. Fee: £3 3s. per session. Full-day courses for registered students. Fees: £15 to £20. Enrolment September 12.

Portsmouth Municipal College

Principal: Oliver Freeman, Wh.Sc., A.R.C.S., B.Sc. Head of Pharmacy Department: F. Hemming, Ph.C., M.P.S. Lecturers: Pharmacy, N. Francis, Ph.C.; Chemistry, G. M. Painter, B.Sc., A.I.C.; Botany, Miss C. M. Gibson, B.Sc. Courses in all subjects for examinations of Pharmaceutical Society and Apothecaries' Hall. Students register between September 6 and 9. Fees: Pharmaceutical Society examinations, £6 6s. to £21; Apothecaries' Assistants examination, £3 3s. to £11 11s.

Preston, Harris Institute

Principal: T. R. Jolly. Affiliated to Universities of Manchester and Liverpool. Tuition in chemistry, physics and botany. Session begins in September. Fee, £9 10s. per session of three subjects, or £3 3s. 4d. per term. One subject, £3 10s. per session; two, £7. Recognised for Preliminary Scientific examination.

Salford Royal Technical College

Principal: Bertram Prentice, D.Sc., Ph.D. Recognised for Preliminary Scientific examination. Day and evening classes for pharmaceutical students in chemistry, botany and physics. Day-course fee: £3 3s. to £7 17s. 6d. per term. Evening: 15s. to £2 2s.

Sheffield Central Commercial College

Principal: W. B. Marshman. Staff: Chemistry: W. Ritchings, M.Sc., Dr. E. B. Sanigar, Ellis Jackson, B.Sc. G. R. Davies, B.Sc. Physics: Dr. C. J. Smith, J. Hiles, M.Sc. Botany: A. Burgess, B.Sc. Recognised for Preliminary Scientific examination. Evening classes. Fee for complete course, £1 1s.; junior students, 10s. 6d.

Southampton University College

Professor of chemistry: D. R. Boyd, D.Sc., Ph.D., F.I.C. Special facilities in chemistry department for

pharmaceutical students. Tuition fees, and further particulars of the courses from the Registrar.

Sunderland Technical College

Principal: V. A. Mundella, M.A., B.Sc. Pharmacy, Dispensing, and Materia Medica: Miss H. C. M. Winch, Ph.C. Chemistry: C. F. Baker, B.Sc., Ph.D. Recognised for Preliminary Scientific and Chemist and Druggist Qualifying examinations. Full-time day, October to July. Fees: £15 15s. Part-time evening, Preliminary Scientific, two sessions, September to July. Fee, £2 first session; £2 5s. second. Qualifying examination, two sessions, September to July. Fee, £3 10s. minimum. Registration date: September 28.

Swansea and West Wales School of Pharmacy

Staff: Pharmaceutical subjects: Harold Davis, Ph.C. (Pereira Medallist). Chemistry: E. A. Tyler, M.A., F.I.C. Physics: J. C. Kirkman, B.Sc., F.P.S. Botany: Mrs. K. G. Hilditch, B.Sc. Courses: Preparatory part-time day and evening; full-time six and nine months' courses for Preliminary Scientific examination; nine months' course for Chemist and Druggist Qualifying examination; nine months' course for Apothecaries' Assistants' examination; revision courses. Fees: Full-time: Six months, £11 11s.; nine months, £15 15s. Session opens September 27.

Wigan Mining and Technical College

Principal: F. J. Harlow, M.B.E., B.Sc. Head of Chemistry Department: E. B. Naylor, M.Sc., F.I.C. Lecturers: H. Crofts, M.Sc., A. Cooksey, B.Sc., H. W. Edmunds, B.Sc. Full-time pharmaceutical course (fee, £10 10s.); revision course (£2 2s.); part-time day and evening courses (£1 1s.). Recognised for Preliminary Scientific examination. Classes for Apothecaries' Assistants' examination and for Chemist and Druggist Qualifying examination.

Wolverhampton and Staffordshire Technical College

Head of Chemical Department: W. Regan, B.Sc. Lecturer in Chemistry: M. H. Schofield, B.A., B.Sc. Materia Medica and Pharmacy: J. M. Caley, M.P.S. Botany: G. D. Nogan. Physics: A. T. Harrison, B.Sc., M. H. Schofield, B.A., B.Sc. Session, September to April, followed by short summer session. Fees: Chemistry or pharmacy, £1 10s.; evening lecture only, 10s. 6d. per session each subject; evening lecture with laboratory work, £1 per session each subject.

SCOTLAND

Aberdeen, Robert Gordon's College

Chemistry: W. Maitland, D.Sc.; R. Craven, B.Sc., G. Sheach, M.A., B.Sc., J. E. Ritchie, M.A., B.Sc., F.I.C. Pharmacy: E. G. Bryant, B.Sc., Ph.D., Ph.C., D. S. Rattray, Ph.C., S. M. Gill, Ph.C. Physics: J. D. Stewart, M.A., G. O. Clark, M.A., B.Sc. Day courses: Preliminary Scientific, Chemist and Druggist Qualifying, and Pharmaceutical Chemist Qualifying examinations, October 12 to June 30, 1928. Fee: Each course, £21. Evening Preliminary Scientific course over four years. Fee: Each stage, £2.

Dundee Technical College

Heads of Departments:—Botany and Pharmacy: D. McCall, B.Sc., Ph.D., Ph.C. Assistant: W. B. Proudfoot, Ph.C. Chemistry: C. W. Cochrane, D.S.O., B.Sc. Physics: W. Cooper, M.A., B.Sc. Students are prepared for all examinations of Pharmaceutical Society of Great Britain and for degree of B. of Pharm. of London University. Classes begin September 19. Evening classes in botany, chemistry and physics on September 12.

Edinburgh, Heriot-Watt College

Principal of College: A. P. Laurie, M.A., D.Sc., F.R.S.E. Professor of Chemistry: A. Archibald Boon, D.Sc., B.A., F.I.C., F.R.S.E. Lecturers:—Chemistry: James Sandilands, F.I.C., R. G. M. Dakers, F.I.C., Hugh

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H. Campbell, B.Sc., A.I.C., A.H.-W.C. Physics: William Watson, M.A., B.Sc., John Milne, B.Sc., T. G. Malpas. Botany: Andrew Howison, M.A., B.Sc. Pharmaceutics: J. C. Henderson, Ph.C., and demonstrators in each subject. Complete courses of instruction for all examinations of Pharmaceutical Society. Winter session commences in October. Full particulars from Professor Boon.

Edinburgh Royal Dispensary and School of Pharmacy

Principal: Eric A. Knott, Ph.C., F.C.S., assisted by F. Jackson, Ph.C., I. D. Campbell. Complete day courses for Preliminary Scientific and Chemist and Druggist Qualifying examinations. Fees: One examination, £21; both, £31 10s. per session (October until July). Evening classes for Preliminary Scientific examination. Fee: per session, £10 10s.

Glasgow Royal Technical College

Superintendent and lecturer in botany: Professor David Ellis, D.Sc., Ph.D., F.R.S.E. Lecturer in pharmacy and pharmacognosy: J. P. Todd, Ph.C. Demonstrators: E. J. Schorn, A.I.C., Ph.C.; W. H. Millar, Ph.C. Classes for the Preliminary Scientific, Chemist and Druggist Qualifying and Pharmaceutical Chemist Qualifying examinations, and also for the degree of B.Sc. (pharmacy), begin in September. Enrolment dates: September 14 to 16.

Paisley Technical College

Principal: Angus MacLean, B.Sc. (Lond.). Head of Chemistry Department: G. G. Gardiner, B.Sc. (Lond.). Lecturers: Chemistry: Thomas A. Wilson, F.I.C., Wilfred Whalley, B.Sc. (Vict.), J. M. Hird, B.Sc. (Lond.), A.R.C.S., J. McKean, F.I.C., John Armour, B.Sc. (Lond.), Agnes J. Kelly, B.Sc. (Lond.). Botany: Alex. C. MacLean, B.Sc. (Lond.). Physics: P. M. McConnell, B.Sc. (Glas.), J. C. Young, B.Sc. (Lond.) Recognised for Preliminary Scientific examination. Session commences September. Fee: 25s.

Apothecaries' Assistants

According to Section 5 of the Apothecaries Act, 1815, if apothecaries refuse to compound or unfaithfully compound physicians' prescriptions, they are liable to a penalty. To help the apothecaries in this work of dispensing, Section 17 enacted that an examination should be instituted for the purpose of granting certificates to persons "to act as an assistant to any apothecary." The conditions of entrance are as follows:—

(a) The candidate (male or female) must be at least eighteen years of age. (b) A certificate of general education up to the age of sixteen must be produced. (c) A certificate signed by a principal teacher of chemistry at a university, university college, technical institute, school of pharmacy, or a secondary school, or by a person possessing a university degree in science, or a fellowship of the Institute of Chemistry, showing that instruction in chemistry has been taken for 200 hours, and that experiments have been performed by the applicant, and (d) a certificate signed by an assistant of the Society holding a public appointment, a registered chemist and druggist, or a registered medical practitioner, showing that instruction in practical pharmacy has been taken for 200 hours and practical work done for nine months, must be produced. (e) The candidate must pass an examination in (1) compounding and dispensing medicines (a practical examination), (2) chemistry, materia medica, pharmacy, and the translation of prescriptions (an oral examination).

The examination takes place in January, April, July and October. The fee is £6 6s., re-examination fee £3 3s. Particulars can be obtained from Mr. Frank Haydon, L.R.C.P., Secretary to the Court of Examiners, Apothecaries' Hall, Blackfriars, London, E.C.4.

Similar powers to examine and grant certificates to assistants are possessed by the Apothecaries' Hall of Ireland, 95 Merrion Square, Dublin. Examination fee, £8 8s.

Dispenserships

Official positions as dispensers or "pharmacists" are open to registered chemists and druggists in hospitals, dispensaries, infirmaries, and other public institutions as follows:—

ARMY.—Pharmacists enlisting into the Royal Army Medical Corps are classified as follows: Class III on enlistment, and Class I after one year's service, provided that they have (a) passed the class of instruction of the Royal Army Medical Corps Depot, (b) qualified as nursing orderly, Class III, (c) qualified in the following subjects of the Dispensers' examination: Surgical instruments and field medical equipment, medical supplies and accounts. Pharmacists are eligible for promotion to non-commissioned officer and warrant officer.

MENTAL HOSPITALS.—The rate of pay for dispensing chemists in the London County mental hospital service is:—Men, £175 per annum, rising by £10 annually to £205, and then by £15 annually to £280; women £140, rising by £7 10s. annually to £170, and then by £10 annually to £200. Temporary additions to meet the cost of living are paid. The hours of duty are not fixed; and annual leave of twenty-one days is allowed.

NAVY.—Assistant pharmacists (whose age on entry must not be less than twenty-one or more than twenty-eight years) are required to hold the Major or Qualifying certificate of the Pharmaceutical Society of Great Britain, or "the certificate of competency" of the Pharmaceutical Society of Ireland, and to produce testimonials and other records. Candidates are required to pass a Selection Board consisting of representatives of the Admiralty and of the Civil Service Commissioners. A preliminary selection of the candidates is conducted by the Medical Director-General of the Navy. The salary begins at £120 per annum (with quarters for unmarried men, or a grant in lieu, and other allowances), and rises by £5 annually to £170. Assistant pharmacists are eligible for promotion to the grades of senior pharmacist (maximum, £250), superintending pharmacist (maximum £350), and head pharmacist (maximum, £400), with quarters or allowance. The annual leave is twenty-eight days, exclusive of Sundays. Members of the pharmaceutical service are required to serve in any of the Royal Naval Hospitals to which they may be appointed, either at home or abroad. They are included in the list of salaried officers, and are entitled to pension under the terms of the Superannuation Acts. Senior, superintending and head pharmacists, if married, are provided with married quarters or allowances in lieu: unmarried officers of those grades are provided with single quarters or allowances in lieu. Members of the pharmaceutical service, while at stations abroad, will be paid a further allowance in addition to the ordinary scale of house allowance to meet the increased cost of living abroad. Applications should be addressed to the Medical Director-General of the Navy, Queen Anne's Chambers, Tothill Street, London, S.W.1.

POOR-LAW INSTITUTIONS.—Appointments in the poor-law service are under the control of the Ministry of Health, and are open to chemists and druggists and a few other classes of dispensers. Salaries vary, boards of guardians fixing their own scales subject to the total coming within the estimate for the current year. Official sanction for each appointment is now not necessary if the appointment conforms to the prescribed conditions. In the Metropolitan unions, salaries are paid according to a scale agreed upon and sanctioned by the Ministry.

PRISON COMMISSION.—The rates of pay and allowances for pharmacists in the prison services are £2 8s. a week, rising to £3 10s., with medical attendance and medicines in certain conditions, and a temporary bonus. Quarters are provided, or 10s. a week in lieu. Candidates for appointment must hold the Pharmaceutical Society's qualification, and it is necessary to be within the prescribed age limits (twenty-four to thirty-five years). There is a probationary period of twelve months at the candidate's own expense, and he must be vaccinated and revaccinated as ordered.

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Ireland—I. Free State

The formation of a separate Pharmaceutical Society in Northern Ireland under the Pharmacy and Poisons Act (Northern Ireland), which was officially decreed on November 23, 1925, has resulted in the separation of pharmaceutical affairs in the Northern counties from those in the Irish Free State, where arrangements for qualifying remain as hitherto. The Pharmacy Act of 1875, under which the Pharmaceutical Society was constituted and incorporated, authorised those registered under it, pharmaceutical chemists, to do dispensing. The sale of poisons was restricted under this Act to persons so registered and to others who previously had had the right, but an amending Act of 1890 further extended the sale of poisons by retail to a class of non-dispensers, registered druggists. Persons who were registered as chemists and druggists under the Acts of 1875 and 1890 are a diminishing body, as the continuance of the title was not provided for under the latter Act. A qualification for assistants to pharmaceutical chemists was also created by the Act of 1890, these being entitled, during the temporary absence of the employer, to transact business. The Irish Pharmacy Acts, 1875 and 1890, differ from the corresponding Acts for Great Britain in that mention is made of the subjects in which candidates for the Licentiate and the Registered Druggist qualification are to be examined—with the addition, in the earlier Act, of "such other subjects as may from time to time be prescribed by any regulations made in pursuance of this Act." The Registrar and Clerk to the Council of the Pharmaceutical Society of Ireland is Miss E. C. Grene, 67 Lower Mount Street, Dublin.

Preliminary Examination

The Pharmaceutical Society of Ireland conducts its own Preliminary examination, but accepts in lieu the certificates of the following examining bodies: The Matriculation or Preliminary examination of the University of Dublin, Public Entrance examination (large certificate); the National University of Ireland, Matriculation examination; the Queen's University of Belfast, Matriculation examination; the Royal Colleges of Physicians and Surgeons, Ireland, Preliminary examination; the Secondary School certificate of Northern Ireland; the Intermediate Education Board for Ireland, Junior, Middle, or Senior Grade examinations in the following subjects: English, Latin, arithmetic, algebra, geometry, and Greek or a modern language; or such other examination as shall be deemed by the Pharmaceutical Council as equivalent thereto, *all the subjects having been passed at one time*. Provided that every certificate accepted shall include Latin as one of its subjects. Any such examination to be passed *prior to the statutory service at pharmacy*, unless such service has been commenced before January 1, 1907.

The subjects of the Preliminary examination are:—

LATIN: Translate and parse sentences from Cæsar's Commentaries ("De Bello Gallico"), first book, or Virgil's "Æneid," first book. Translate an easy English sentence into Latin.

ENGLISH: English grammar, including orthography and parsing. Write on a subject selected by the examiner, and write from dictation.

ARITHMETIC: First four rules, simple proportion, vulgar fractions and decimals. Describe the British weights and measures and the metric system.

ALGEBRA: As far as simple equations, inclusive.
GEOMETRY: Including the first book of Euclid.
Also one modern foreign language.

The examination is held at 67 Lower Mount Street, Dublin, on the first Thursday and following day in January, April, July and October, at 10 a.m. A fee of £3 3s. must be lodged with the Bank of Ireland to the credit of the Society, and the receipt forwarded to the Registrar (Miss E. C. Grene), 67 Lower Mount Street, Dublin, with birth certificate and the name of the optional subject, at least fourteen clear days before the commencement of the examination. The re-examination fee is £2 2s. A copy of the marks awarded in the examination to any candidate is supplied for 2s. 6d. The Irish Preliminary examination is accepted by the British Pharmaceutical Society as an entrance examination.

Pharmaceutical Licence

The qualifying examination for pharmaceutical chemist in Ireland is that of Licentiate. The conditions to be fulfilled before entering upon the Pharmaceutical licence examinations are:—

(a) After preliminary registration the person must serve four years as apprentice or assistant with, and in the sole employment of, a pharmaceutical chemist, or a chemist and druggist, of Great Britain, or an apothecary, or a firm of legally qualified pharmaceutical chemists, chemists and druggists of Great Britain, or apothecaries in an open shop, and the candidate must spend the business day with his employer. (Provision is made for service with more than one employer, and, for those who have served four years with a chemist and druggist or registered druggist in Ireland, two years' further service with a pharmaceutical chemist or an apothecary suffices.)

(b) Attend three months' courses of lectures in theoretical chemistry and in botany and materia medica, and a three-months' course of practical chemistry (after the lectures in theory) at one or other of the following approved institutions:

School of the Pharmaceutical Society of Ireland.

School of the Pharmaceutical Society of Great Britain.

Central Technical Institute, Waterford.
Municipal Technical School, Ballymena.
Municipal Technical School, Londonderry.
Municipal Technical School, Drogheda.
Municipal Technical Institute, Limerick.
City of Dublin Technical Schools.
Government School of Science, South Kensington.
Queen's University, Belfast.
University College, Galway.
Royal College of Science for Ireland, Dublin.
Royal College of Surgeons in Ireland, Dublin.
School of Physic, Trinity College, Dublin.
Anderson's Medical School College, Glasgow.
Royal Academical Institution, Belfast.
Municipal Technical Institute, Belfast.
Crawford Municipal Technical Institute, Cork.
Municipal Technical School, Newry.
Central Technical Institute, Clonmel.
Municipal Technical Institute, Dundalk.
Municipal Technical School, Lurgan.
City of Galway Technical Institute.

Some of these are approved for all the subjects, others for one or two subjects only.

(c) The person must be twenty-one years of age.

(d) Declarations and certificates of the foregoing must be lodged with the Registrar when the candidate applies for entry to the Licence examination.

IRISH (FREE STATE) PHARMACY QUALIFICATIONS

(IN BRIEF)

L.P.S.I.

1. Pass Recognised Preliminary before apprenticeship.
2. Four years' apprenticeship in a pharmacy.
3. Courses, in an approved institution, of three months in (a) Theoretical Chemistry, (b) Botany and Materia Medica, (c) Practical Chemistry.
4. Pass Pharmaceutical Licence Examination after the age of 21.

R.D.

1. Serve four years as assistant or apprentice.
2. Pass Registered Druggist Examination.

PHARMACEUTICAL ASSISTANT

As for L.P.S.I., but need not be 21, nor have taken courses of instruction.

Educational Information

The examination commences on the second Wednesday of January, April, July and October, at 10 a.m., and is held in the Pharmaceutical Society's House, Dublin. Candidates must give notice of intention to attend, to the Registrar, fourteen clear days before the date of the examination, and this must be accompanied by a receipt of having paid the fee (£10 10s.) into the Bank of Ireland to the credit of the Society. The necessary forms should be procured well in advance. The re-examination fee is £4 4s. The examination, which is written, practical and oral, is in the following subjects:—

BOTANY: Recognition of the principal indigenous plants used in medicine, their natural orders, and the characters of their several parts.

MATERIA MEDICA: Recognition of B.P. drugs; their characters, active principles, sources, official preparations, and adulterations.

CHEMISTRY: Elementary laws of chemistry and physics, including equations. Recognition of B.P. chemicals, description of the processes by which they are obtained, qualitative analysis (including B.P. tests) and volumetric analysis, and a practical examination in these subjects. (The Council recommends Corbyn and Stewart's "Physics and Chemistry.")

PRACTICAL PHARMACY: Translation of Latin prescriptions, detection of dangerous doses, and compounding and dispensing. Processes of making and recognition of B.P. non-chemical preparations, and an intimate knowledge of the Sale of Poisons (Ireland) Act, 1870.

Assistants to Pharmaceutical Chemists

This examination, instituted as a qualification for assistants left temporarily in charge of the business of a pharmaceutical chemist, is held quarterly, being on the Saturday following the examination for the Pharmaceutical Licence. This permits candidates "referred" at the latter examination to enter for the assistants' examination on payment of a fee of £1 1s. New candidates pay, in addition, a registration fee of £1 1s. The re-examination fee is £1 1s. The conditions are similar to those of the Licence examination, but the candidate need not be twenty-one years of age, nor have taken a special course of instruction. The subjects are:—

PRESCRIPTIONS: Candidates will be required to read orthograph prescriptions, translate them into English, render a correct translation of the directions for use, and detect unusual doses.

PRACTICAL DISPENSING: To weigh, measure, and compound medicines, write the directions in suitable language, finish and properly direct each package.

MATERIA MEDICA AND QUALITY OF SPECIMENS: To recognise the Pharmacopoeia chemicals in frequent demand, and specimens of roots, barks, leaves, fruits, resins, and gums, in ordinary use; also to estimate the quality of each specimen submitted, and its freedom from adulteration.

PHARMACY: To recognise the preparations of the Pharmacopoeia which are not of a definite chemical nature, such as extracts, tinctures, and powders, and give the proportions of the more active ingredients.

The candidates will also be examined in the Sale of Poisons (Ireland) Act.

Registered Druggists

The subjects of the examination are prescribed by the Pharmacy Act (Ireland) Amendment Act, 1890, and are as follows:—

English orthography and composition.

Arithmetic and the weights and measures of the British Pharmacopoeia.

The appearance of properties of the various drugs and chemicals in general use.

The Sale of Poisons (Ireland) Act.

The examination is open to anyone who has served as an assistant or apprentice for not less than four years to a pharmaceutical chemist, chemist and druggist, registered druggist, or licentiate apothecary keeping open shop, and is held in Dublin and Belfast (if twelve candidates apply) on the second Tuesday of January, April, July and October. Applications for admission, accompanied by the necessary declarations of service and a receipt for £4 4s. placed to the credit of the Society in the Bank of Ireland, must be made to the Registrar at least fourteen days before the dates of the examinations. The re-examination fee is £2 2s.

II. Northern Ireland

Preliminary Examination

The Pharmacy and Poisons Act (Northern Ireland), 1925, which decreed the separation of pharmaceutical affairs in Northern Ireland from those in the Irish Free State, established the pharmaceutical chemist as the only person in Northern Ireland to keep open shop for the sale of poisons and for compounding the prescriptions of medical practitioners. The grade of registered druggist was abolished, and modified examinations for those who were already engaged in trade at the time of the passing of the Act were instituted. A feature of the official examinations is a paper on business methods.

Before a student can become apprenticed he must pass a Preliminary examination in English, mathematics, and three other subjects (one of which must be a language) from the following list: Latin, Greek, French, German, Spanish, Italian, modern history, geography, botany, chemistry, physics or mechanics. The five subjects must have been passed at one, or not more than two, of the following examinations:—The Matriculation examination or the Pharmaceutical Preliminary examination of the Queen's University, Belfast, or any examination accepted by the University as equivalent to these examinations, including the Preliminary examinations of the Royal College of Physicians and Surgeons in Ireland, Educational Institute of Scotland, College of Preceptors, Junior Certificate of the Ministry of Education, Northern Ireland. The majority of candidates will probably take the Pharmaceutical Preliminary examination of the Queen's University, for, although the Pharmaceutical Society of Northern Ireland does not hold its own Preliminary examination, the University authorities, in the examination mentioned, conduct what is virtually the official examination. Candidates in the first instance must apply to the Secretary of the Pharmaceutical Society of Northern Ireland, 55-56 Scottish Provident Buildings, Belfast, at least one month before the last day of entry for Matriculation. They will be examined on the papers set for the Queen's University Matriculation examination, and must reach the standard set for the Pharmaceutical Preliminary, which is below Matriculation standard. An application for the Preliminary certificate of apprenticeship to a pharmaceutical chemist must be accompanied by £3 3s. Having obtained this, the student will register officially as an apprentice at the Ministry of Home Affairs (fee 5s.). A four-years' apprenticeship to a pharmaceutical chemist or four years with a registered druggist and two years with a pharmaceutical chemist then begins.

Pharmaceutical Chemists

Under the Regulations there are various transitory provisions whereby persons already in the trade at different stages of advancement when the Act was passed undergo modified conditions of examination. Full particulars of these may be obtained from the Secretary. Persons who, after the passing of the Act, have been granted a Preliminary certificate as an apprentice, and submit evidence that they have received satisfactory training and attended an approved course of instruction with specified number of hours (botany, 140 hours; chemistry Part I, 140 hours; physics, 70 hours; chemistry Part II, 140 hours; pharmacognosy, 100 hours; pharmacy, 56 hours; practical pharmacy, 84 hours) may also, until June 30, 1928, undergo a modified examination together with an oral examination in physics and business methods. After December 1929 the examination must be taken in two parts. Having satisfied the requirements as to apprenticeship and attendance at approved courses of instruction the candidate under the new Regulations must pass Part I, the subjects of which are botany, chemistry Part I, physics and business methods [or pass the Intermediate examination of the Queen's University, Belfast]:—

BOTANY.—The elements of plant morphology and anatomy, physiology classification. Practical examination of plants and preparation of sections for the microscope.

Educational Information

CHEMISTRY, PART I.—An elementary knowledge of chemical action, laws, valency; non-metals, metals, carbon, methane, ethylene and acetylene; methods of determining carbon, hydrogen, oxygen and nitrogen in organic compounds. Solve simple problems in weight and volume. *Practical.*—Preparation of inorganic substances; qualitative and quantitative (volumetric) analysis.

PHYSICS.—Elementary knowledge of mass, energy and work, solids, liquids, gases; temperature; propagation of light, magnetism and electricity. *Practical.*—Perform simple experiments on the above.

BUSINESS METHODS.—Book-keeping, including business books required in a pharmacy; double entry; balance-sheets; commercial law relating to master and servant, leases, agreements and contracts. A working knowledge of matters likely to arise in pharmaceutical practice relating to licences, insurance, income-tax, partnership and company trading, elementary principles of advertising and salesmanship; modern methods of window display; shop-craft, including arrangement of a shop, windows, heat, ventilation, counters, wall and counter-cases and general lay-out.

Having passed Part I at not more than two examinations, the candidate supplies evidence of age, 21, attendance at approved courses in the subjects of Part II as follows [Alternatively, the candidate may submit to the Board of Examiners evidence that he has passed the examination in all subjects of Final Part I for the B.Sc. in pharmaceuticals of the Queen's University, Belfast, and present himself for oral and practical examinations in pharmacy, practical pharmacy, Latin and prescription reading. A candidate who fails to satisfy the examiners in any one of these three subjects must present himself in all three subjects at any subsequent examination]:

PHARMACOGNOSY.—Recognition of B.P. drugs, their sources, characters, active principles, varieties, natural orders, knowledge of B.P. tests of crude drugs or official products.

PHARMACY.—Knowledge of operations requiring heat, disintegration of solid substances, filtration, expression, solution, art of dispensing, manufacture of galenicals.

LATIN AND PRESCRIPTION READING.—Translation of Latin prescriptions; detection of errors; knowledge of posology; percentages.

PRACTICAL PHARMACY.—Perform operations of the B.P. in making galenicals. Compound and dispense medicines.

FORENSIC PHARMACY.—Knowledge of poisons in the fourth Schedule to the Pharmacy and Poisons Act (Northern Ireland), 1925, and conditions relating to keeping, selling and dispensing. Dangerous Drugs Acts and Regulations.

CHEMISTRY, PART II.—General knowledge of B.P. and common alkyl and aryl compounds; adulterations in B.P. inorganic and organic compounds and methods of determining purity. *Practical:* Identify specified organic compounds; detect adulterants of B.P. substances; volumetric and nitrometric determinations; methods of preparing more important inorganic and specified organic compounds; alkaloidal determinations.

The examinations are held in June and December, examination fees being £4 4s. for Part I and £8 8s. for Part II. For re-examination, half these fees.

Assistants to Pharmaceutical Chemists

An examination is held biennially (June and December) for persons desirous of being registered under the Act

as assistants competent to conduct the business of a pharmaceutical chemist during the temporary absence of the principal (not to manage or conduct a business or keep open shop on his own account).

Candidates, aged twenty-one years or more, must submit evidence of four years' apprenticeship, also that they have previously been granted the Preliminary Certificate of Apprentice. Afterwards candidates are examined on the syllabus presented in Appendix II (a), which is, briefly:—

PHARMACY.—Recognition of official extracts, tinctures and powders, and chemical substances; methods of manufacture and testing; poisons laws and regulations.

PRACTICAL PHARMACY.—Preparation of pharmacopoeial products, ointments, pill masses, powders, solutions, spirits, suppositories, syrups, tinctures, vinegars and wines. Compounding and dispensing of medicines. Deciphering and expanding into full Latin or English of more or less normal prescriptions, together with the detection of dangerous doses of the more potent ingredients.

PHARMACOGNOSY.—Recognition of B.P. drugs, their characters and sources; the official preparations and commoner adulterations.

BOTANY.—The plant, shown by representative dicotyledons and monocotyledons; physiology. Recognition of principal indigenous plants used in medicine, together with the description.

The examination fee is £6 6s.; at any subsequent examination for unsuccessful candidates the fee is £3 3s.

NORTHERN IRELAND PHARMACY QUALIFICATIONS

(IN BRIEF)

PHARMACEUTICAL CHEMIST

1. Pass recognised Preliminary Examination.
2. Serve apprenticeship (a) four years under pharmaceutical chemist or (b) four years under registered druggist and two years under pharmaceutical chemist.
3. Attend approved courses in Part I.
4. Pass Part I (a) Botany, (b) Chemistry, (c) Physics, (d) Business Methods. Fee £4 4s.
5. Attend approved courses in Part II.
6. Pass Pharmaceutical Chemist Examination at age 21 (a) Chemistry (2), (b) Pharmacognosy, (c) Pharmacy, (d) Practical Pharmacy, (e) Latin, (f) Prescription Reading. [Compulsory division of examination not until December 1929.] Fee £8 8s.

PHARMACEUTICAL ASSISTANT

1. Pass approved Preliminary Examination and serve apprenticeship as above; age 21.
2. Pass examination for Assistants' Certificate. Fee £6 6s.

Irish Educational Institutions

Pharmaceutical Society's Schools

67 Lower Mount Street,
Dublin

Director: Chemistry School,
Professor H. Norminton,

M.Sc. Botany and Materia Medica School, Dr. W. H. Ashmore, M.P.S.I., P. O'Connor, B.Sc. Three sessions commence on October 1, January 1, and April 1. Fees: Theoretical chemistry (three months), £1 11s. 6d.; practical chemistry (100 hours), £8 8s.; practice course (three months), past students, £2 2s.; students of other schools, £4 4s.; botany and materia medica (three months), £3 3s. The theoretical chemistry course must be completed before the practical chemistry course is commenced. Botany and materia medica classes held on Tuesday and Thursday evenings with occasional Saturday demonstrations.

Belfast Chemists' and Druggists' Society

Lecturers: Mr. Arthur Storey, L.P.S.I., and Mr. J. Getty, L.P.S.I. Courses in pharmacy, pharmacognosy, botany, chemistry. Fees for each class, £1 1s. per quarter.

Belfast Municipal College of Technology

Head of Chemistry Department: Professor H. Wren, D.Sc. Lecturer in Materia Medica and Pharmaceutical Botany: T. Harper, M.P.S.I. The Pharmaceutical Section of the Pure and Applied Chemistry Department provides courses in chemistry, botany, materia medica, and pharmacy (evenings). Fees from 7s. 6d. per subject per session. Day and evening courses for examinations of Pharmaceutical Society of Northern Ireland.

Educational Information

Scholarships and Prizes

Students of pharmacy may compete for several scholarships and prizes, the training for which is not without benefit, even to the unsuccessful candidates.

THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN offers annually three medals for competition by pharmaceutical chemists who have passed the Major examination during the year, and were members of the Society at the time of passing. The (written) examination is in *materia medica*, botany, and chemistry, and is held shortly after the Major examination in April. The first prize is the Pereira silver medal and £5 worth of books; second, the Society's silver medal; and third, the Society's bronze medal. Each prize-winner is now also presented with books provided from the Harrison memorial fund. The Society also has in its gift the following:—

Jacob Bell Scholarships.—A scholarship is offered annually by the Society as a memorial of Jacob Bell. The award comprises free instruction at the Society's School and £25 or £50 in cash, with a gift of books. The scholarship is open only to student-associates of the Society not less than nineteen nor more than twenty-two years of age. The second competitor in order of merit will be called a Manchester scholar if eligible to hold that scholarship (*see below*). Application for admission must be made to Mr. Hugh N. Linstead, Secretary and Registrar, 17 Bloomsbury Square, London, W.C.1.

The Burroughs Scholarship of about £50, awarded (together with apparatus, etc.) to a pharmaceutical chemist every second year for the purpose of obtaining advanced instruction in the Society's laboratory.

Devon and Cornwall Exhibition in Pharmacy, of the annual value of about £25, is tenable at the University College of the South-West, Plymouth, and is applied to the payment of tuition fees. Candidates must have been trained during a specified period in a Devon or Cornwall shop or institution.

Herbarium Prizes.—The Council of the Society offers annually to its student-associates a silver medal, a bronze medal and certificates of honour for an herbarium of British plants collected in any part of the United Kingdom, the Channel Islands or the Isle of Man between January 1 in one year and July 1 in the following year. Competitors must be under twenty-one years of age.

The Charles James Hewlett Memorial Exhibition is of the value of about £15, and is awarded annually on the recommendation of the professors of the Society's School to the student-associate (other than a Bell scholar) who most distinguishes himself during attendance at the elementary course.

Leverhulme Scholarships.—A fund endowing three scholarships of the annual value of £60 each was presented to the Society by the late Lord Leverhulme in 1923. Students between the ages of nineteen and twenty-two who have completed the period of practical training for the Qualifying examination are eligible. The examination is held on the first Tuesday in July in certain centres, and entries must be received at Bloomsbury Square by June 1. The first scholarship carries with it a gold medal, and the second a prize of books to the value of £10. The examination consists of papers in botany and pharmacy, chemistry and physics, and business methods.

Manchester Pharmaceutical Association Scholarship is open to student-associates of the Pharmaceutical Society who have served an apprenticeship in Lancashire, Cheshire, or the High Peak Parliamentary Division of Derbyshire. It has an annual value of £34. (*See Jacob Bell Scholarships*).

The Petrie Trust Bursary, of the annual value of £16 to £20, is awarded each year to a student-associate of the Society who has completed three years' apprenticeship in the city or county of Aberdeen, and has not previously studied at a school of pharmacy. Particulars may be obtained from the Secretary of the Aberdeen Pharmaceutical Association.

The Ransom Research Fellowship, of the value of £200 per annum, was founded in 1917 to promote the investigation of crude drugs, and is awarded to a pharmaceutical chemist, who must not engage in unauthorised commercial work while holding the Fellowship.

The Redwood Scholarship, of the value of about £60 in cash, awarded every second year (together with apparatus, etc.) to a pharmaceutical chemist to pursue work in the Society's research laboratory.

No competitor is awarded more than one scholarship in the same year.

In the year 1928, and until further notice, the scholarships will be awarded in accordance with the following regulations:—

1. There shall be one examination for all the scholarships, which will be conducted by an examiner or examiners appointed by the Council of the Society, and the awards made by the Council on the recommendation of such examiner or examiners.

2. The examination will be held on the third Tuesday in June of each year in Aberdeen, Birmingham, Cardiff, Edinburgh, Exeter, Leeds, London, Manchester and Newcastle, or such other centres as may from time to time be selected by the Council of the Society.

3. At the time of giving notice of their intention to enter for the examination, competitors must be student-associates of the Society.

4. No person shall be awarded more than one scholarship, but a person may compete for all the scholarships for which he is eligible at the same examination. Should he gain marks entitling him to the award of more than one scholarship he will be permitted to select the scholarship he wishes to have awarded to him. Any scholarship which he does not select shall be awarded to the competitor eligible for that scholarship who gains the next highest number of marks.

5. On the day on which the examination is held, competitors must be not less than 19 nor more than 22 years of age.

6. Competitors must give notice to the registrar in London on or before June 1, in the year in which the examination is to take place. The notice must be accompanied by a registrar's certificate of birth, an employer's testimonial, and a declaration as to practical training. Particulars may be obtained from the Secretary and Registrar, 17 Bloomsbury Square, London, W.C.1.

At the same time the competitor must state (a) the language subject in which he wishes to be examined, and (b) the examination centre at which he wishes to attend.

THE CHEMISTS' AND DRUGGISTS' SOCIETY OF IRELAND.—The Haslett Gold Medal is awarded annually to the student who takes the first place at the Pharmaceutical Society of Ireland's Registered Druggist examination.

THE PHARMACEUTICAL SOCIETY OF IRELAND.—The Council awards annually a gold and a silver medal to pharmaceutical chemists who have during the year passed the Licence examination on a first attempt and obtained the following standard of marks: For the gold medal, not less than 240 marks out of 300, and 65 in each of the three subjects; for the silver medal, 230 marks out of 300, and 60 in each of the three subjects.

THE FAIRCHILD SCHOLARSHIP, which was founded in 1904 by Fairchild Brothers & Foster. The object of the scholarship is to encourage study during apprenticeship. The examination is designed not as a test for completed studies, but to see how far the student has used his time and powers of observation during apprenticeship so as to fit himself or herself to appreciate fully the subsequent course of study. The value is £60, and, in addition, there are prizes of £5 for the best student in England, Scotland, Wales and Ireland, apart from the scholarship. The examinations take place during June, and entries should be made on, or before, June 1. The examinations are held in London, Manchester, Edinburgh, Cardiff, Dublin and Belfast, the amount over 5s. railway fare being refunded if application is made to the Secretary. The age limit is not less than 20 years on July 1, 1928, or over 22 on January 1, 1928, and all competitors must be registered students or apprentices of pharmacy. The successful student must commence his studies within the year after winning the scholarship. The subjects are: Chemistry; physics; botany; practical pharmacy and prescription reading; business knowledge. The trustees are Mr. Peter Boa, Edinburgh; Mr. Albert Hagon, Cardiff; Mr. William Kirkby, Manchester; Mr. A. J. Phillips, London. All communications should be addressed to the Secretary to the Trustees, Mr. Herbert Skinner, Ph.C., Albert Chambers, 64-65 Holborn Viaduct, London, E.C.1.

"CORNER FOR STUDENTS" PRIZES.—THE CHEMIST AND DRUGGIST conducts a monthly competition in qualitative chemical analysis. The next series of competitions commences in October.



Educational Information



Medicine

The proportion of registered medical men to population in the British Isles has increased considerably in recent years. In 1881, for example, the respective figures were 23,275 and 35,241,482; in 1925 they were 51,738 and 48,225,000. This fact, coupled with the truism that the life of a general practitioner is an exacting one, does not appear to be lessening the flow of entrants to the profession; the conclusion may therefore be drawn that the advantages of qualifying outweigh the drawbacks. The strictness with which the General Medical Council discharges its disciplinary duties tends to promote a satisfactory standard of general conduct among medical men, with a corresponding reaction on their social status; and the financial interests of physicians and surgeons are looked after by the British Medical Association, which, with a membership of more than 31,000, advises applicants for public posts as to the adequacy of the salaries offered. General practice claims the majority of those who pass their examinations; but there are numerous openings in the Army, Navy, the Air Force, municipal and other public posts, and research. Some of the universities and hospitals hold post-graduate courses.

The General Medical Council is empowered, by Sections 18 and 20 of the Medical Act, 1858, to obtain information from colleges and other bodies as to courses of study and examinations. Candidates for the profession are required to possess, at the outset, a general education of the standard needed for matriculation in arts or science at a British university, together with evidence of having passed an approved examination in elementary physics and elementary chemistry and of having commenced medical study, and, after registration as medical students, to take a course of study and training, extending on the average to five years, at a recognised institution. There are two types of medical qualification, the degrees bestowed by the universities and the diplomas given by such bodies as the Royal Colleges of Physicians and Surgeons.

Preliminary Examinations

The education committee of the General Medical Council issues a list of examining bodies the examinations of which in general education fulfil the conditions laid down by the Council as to admission as a medical student (see "Registration as Medical Students"). These examinations include (1) the final arts or science degree examination of any university of the United Kingdom or of the British Dominions; (2) the matriculation examination of any university in Great Britain or of certain examining bodies in Ireland; (3) a number of school and other examinations accepted by approved universities as equivalent to their respective matriculation examinations. Any preliminary examination recognised as from January 1, 1923, must include:—(1) English; (2) elementary mathematics; (3) a language, from a selected list, other than English; (4) a second language from the list or one of the following subjects—higher mathematics, history, geography, chemistry, physics, zoology, botany, biology, geology. A Joint Matriculation Board (Secretary, 315 Oxford Road, Manchester) governs the Matriculation examinations of the Universities of Manchester, Liverpool, Leeds, Birmingham, and Sheffield. The College of Preceptors, Bloomsbury Square, London, W.C.1, holds in March and September of every year, at various centres in Great Britain, a Professional Preliminary examination for certificates recognised by the General Medical Council and other bodies. The fee is 25s., plus a local fee of from 5s. to 15s. A similar examination is held by the Educational Institute of Scotland, 47 Moray Place, Edinburgh, in February, June, August and November (calendar, 6d.; examination papers, 1s.). It should be borne in mind that the subjects which are compulsory and those which are optional differ to some extent in the requirements of the various universities and other qualifying bodies; consequently, the candidate must either matriculate at the university at which he or she

intends to study or ascertain that the Preliminary examination certificate held is one that will be accepted.

Registration as Medical Students

The way of entrance to the medical profession is laid down in "Regulations of the General Medical Council in regard to the Registration of Medical and Dental Students" (1s., post free, from the Registrar, 44 Hallam Street, London, W.1).

The following is a summary of the regulations:—

- (1) Before registration as a student every candidate shall produce evidence that he has attained the age of seventeen years.
- (2) The minimum standard of general education required will be that of University matriculation or entrance examination in arts or pure science.
- (3) Before registration as a student every applicant shall be required to have passed an approved examination in general education, and, in addition thereto, an examination in elementary physics and elementary chemistry conducted or recognised by one of the licensing bodies.
- (4) A student who has diligently attended an approved course of instruction in elementary biology at a secondary school or other teaching institution recognised by a licensing body may be admitted to the Professional examination in elementary biology immediately after his registration as a student.

The commencement of the course of professional study recognised by any of the licensing bodies should not be reckoned as dating earlier than fifteen days before the date of registration. The Registrars to whom, according to the division of the United Kingdom in which the student is training, application must be made for registration are:—

The Registrar of the General Medical Council, 44 Hallam Street, Portland Place, London, W.1.

The Registrar of the Scottish Branch Council, 20 Queen Street, Edinburgh.

The Registrar of the Irish Branch Council, 35 Dawson Street, Dublin.

The General Medical Council enjoins that in every course of professional study and examination, which must occupy not less than five academic years, the following subjects shall be comprised:—

- (1) *Elements of General Biology*, including practical work and an introduction to the study of embryology; (2) *Chemistry, Physics, and Biology* in their application to medicine; (3) *Human Anatomy and Human Physiology*, including dissection, histology, elements of human embryology, biochemistry and biophysics; (4) *Elementary Bacteriology*; (5) *Pathology*; (6) *Pharmacology and Materia Medica*, including pharmacological chemistry; (7) *Forensic Medicine, Hygiene, and Public Health*; (8) *Medicine*, including applied anatomy and physiology, clinical pathology, and therapeutics; (9) *Surgery*, including applied anatomy and physiology, and clinical pathology; (10) *Midwifery and Diseases of Women*.

A few bodies allow medical studies to be commenced at approved teaching institutions other than medical schools, and this principle is extended to graduates in arts or science at approved universities. No general exemption of this kind is given to registered chemists and druggists except as regards training in practical pharmacy. The preliminary examination must have been of the standard given in the regulations, but the colleges and universities consider applications for exemption from any part of the medical examinations when such subjects as chemistry and biology have been taken at recognised institutions. Each examining body issues regulations as to the studies required, and the schools of medicine arrange their courses in conformance with such requirements.

University Degrees

In the following paragraphs we indicate concisely the conditions framed by the universities of the places named for degrees in medicine and surgery (M.B., Ch.B., or the equivalent degrees). For other and higher degrees further courses of study and fees are requisite.

ABERDEEN.—The two degrees are conferred together, and cannot be taken separately. The curriculum extends over a period of not less than five years, during which

Educational Information

the candidate must attend the prescribed courses of instruction. The fee for the two degrees is £34 13s., payable in four instalments. Bursaries, scholarships and fellowships to the annual value of over £1,180 are obtainable. Regulations (1s.) may be obtained from the Secretary, or from the University Press.

BELFAST.—Three academic years at least, out of the five prescribed for the curriculum, must be passed in the University. The examination and graduation fees amount to £23 2s. The Dean of the Faculty of Medicine is Professor W. St. Clair Symmers, M.B.

BIRMINGHAM.—The course extends over five years, and there are five examinations, the fees for which amount to £20. Several scholarships are available. As a rule, the first four years of the course must be spent in the University, the minimum being three years. Dean of the Medical Faculty, Mr. W. F. Haslam, M.B., University Medical Buildings, Edmund Street.

BRISTOL.—There are three examinations, the total fees for qualifying (including graduation fee) amounting to about £27. The curriculum occupies five years, three of which must have been passed in Bristol. Particulars of scholarships and prizes are given in the University (Faculty of Medicine) prospectus. Registrar, Mr. E. G. Francis, M.A.

CAMBRIDGE.—Students who have not graduated in Arts are required to pass the Previous examination or its equivalent before proceeding to the three examinations for the M.B. degree. The respective fees for these three examinations are £5 5s., £6 6s., and £10 10s. The degree fees amount to £10 10s. A thesis must be composed by each candidate, and must be publicly read (or such portion of it as the Regius Professor shall direct) by the author. There is no separate examination for the B.Ch. degree. The Registry is Mr. E. Harrison, M.A., University Press Building.

DUBLIN.—Candidates for the degrees in medicine, surgery and obstetric science must be of B.A. standing and must have completed five years in medical studies. The degree fees amount to £17. Dean of the Faculty of Physic, Dr. A. F. Dixon.

DURHAM.—There are four examinations for the M.B., B.S., degrees, and the course of study extends over five years, one of which must be spent at the University's College of Medicine. The fees for matriculation and examination amount to £35 3s. Numerous scholarships and prizes are offered. Full information may be obtained from the Registrar, University of Durham College of Medicine, Newcastle-upon-Tyne.

EDINBURGH.—The course for the degrees of M.B. and Ch.B., which are not conferred separately, extends over five years. Candidates must attend for not less than two years at the University. There are four examinations, the fees amounting to £34 13s. Several scholarships, bursaries and prizes are offered for competition. Dean of the Faculty of Medicine, Professor Lorrain Smith, M.D.

GLASGOW.—There are four examinations. The period of study prescribed is five years, with specific regulations as to the lengths of the various courses of instruction. The fees (after registration) for the degrees of M.B., Ch.B., amount to £34 13s. Several bursaries and prizes are open to competition. The Dean is Professor Currie, M.D., University of Glasgow.

IRELAND.—The National University of Ireland confers the M.B., B.Ch., and B.A.O. degrees (simultaneously)

after passing four examinations during a minimum period of five years' study. Particulars may be obtained from the Registrar, National University, Dublin.

LEEDS.—There are three examinations, and the course of study extends over five years. Attendance at approved courses of instruction is obligatory. The matriculation, examination, and conferment fees amount to £34. Dean of the Faculty of Medicine, Professor J. K. Jamieson, M.B., C.M.

LIVERPOOL.—The curriculum extends over five years, two of which must be passed in the University. There are three examinations, with a fee of £5 each, and an admission-fee of £6. Several fellowships, scholarships and prizes are available. Dean of the Faculty, Dr. W. J. Dilling.

LONDON.—The normal course of study extends over five and a half years, and there are three examinations, the second of which is divided into two parts. The examination fees for the double degree amount to £31 10s. A large number of institutions in the United Kingdom and the Colonies is recognised for teaching

and giving certificates, and various concessions are granted in respect of examinations already passed at recognised institutions. There are several studentships and research grants available. Internal and external students should apply respectively to the Academic Registrar and the External Registrar, University of London, South Kensington, S.W.7.

MANCHESTER.—Four examinations for the two degrees, after study extending over not less than five years, must be passed. Two of these years must be spent in the University. Several scholarships, exhibitions and other competitive prizes are offered to students. Information is obtainable from Professor J. S. B. Stopford, M.D., Dean of the Medical School (as to classes) and the Registrar (as to examinations).

OXFORD.—The regulations stipulate that candidates must hold an Oxford arts degree as a prerequisite. Two examinations are held (after a preliminary examination in natural science) for the degree of B.M.;

the degree of B.Ch. is granted with that of B.M. after passing the second examination. The minimum time in which the degrees can be obtained is about six years from the commencement of "residence." Examination and degree fees amount to approximately £53. The Dean of the School of Medicine is Dr. E. W. Ainley Walker, Department of Medicine, University Museum; and the examination statutes are published by the Oxford University Press.

ST. ANDREWS.—The course for the M.B., Ch.B. degrees (which are not separable) extends over at least five years, and the prescribed order of studies must be followed. There are four examinations, the fees amounting to £34 13s. Dean of the Faculty, Professor James Charteris, M.D., Medical School, Dundee; Secretary of the University, Mr. Andrew Bennett.

SHEFFIELD.—There are four examinations for the M.B., Ch.B. degrees, the curriculum occupying five academic years. Candidates who are referred in the Final examination (Part II) must produce evidence of having received subsequent instruction satisfactory to the Faculty before entering for re-examination. The examination fees amount to £20. Several scholarships are available. Dean of the Faculty, Professor J. S. C. Douglas; Registrar of the University, Mr. W. M. Gibbons, M.A.

To qualify as a MEDICAL PRACTITIONER

- (1) Pass recognised preliminary and pre-registration examinations.
- (2) Produce evidence of having commenced study at an approved institution, and be registered as a student by one of the Registrars of the General Medical Council.
- (3) During a curriculum of not less than five years, pass, at proper intervals, the necessary examinations.

Educational Information

WALES.—The course of study is divided into two parts, each extending over three academic years. A degree, in science or arts, of some approved university, is necessary before the medical degrees can be conferred. Examination fees are £20 10s. The constituent colleges are Aberystwyth, Bangor, Cardiff, and Swansea. Dean of the Faculty, Mr. A. W. Sheen, M.S.; Registrar, Mr. D. B. Anthony, M.A., Cathays Park, Cardiff.

Medical and Surgical Diplomas

M.R.C.S. ENG. AND L.R.C.P. LOND.

The Royal College of Physicians of London and the Royal College of Surgeons of England (known as "the Conjoint Board") grant a joint diploma (the "Double Qual.") for registration as a general medical practitioner. There are two professional examinations (in addition to the Pre-medical examination in chemistry and physics) during the five years' curriculum subsequent to registration as a medical student.

The subjects of the *First Professional Examination* are:—Section I, (a) Anatomy, including histology and embryology; (b) Physiology, including bio-chemistry. Section II, Pharmacology, practical pharmacy, and materia medica. Candidates may present themselves for the two sections together or separately, but they must take Parts (a) and (b) of Section I together until they have passed in one or both parts. Candidates will not be allowed to pass in one part unless they obtain at the same time at least half the number of marks required to pass in the other part. Section II may be passed at any time before the candidate enters for the Final examination. Before admission to the First examination, candidates must produce evidence of having attended:—For Section I: (1) Courses of instruction in anatomy, including embryology, during five terms, during which they must have dissected the whole body; (2) courses of instruction in physiology, including general biology, bio-chemistry, and bio-physics, during five terms; (3) a course of instruction in histology. For Section II: Courses of instruction in pharmacology, practical pharmacy and materia medica. The fee for the whole examination is £10 10s.

The subjects of the *Final Professional Examination* are:—Section I, Pathology (including morbid anatomy, morbid histology, and clinical pathology) and bacteriology. Section II, Part I, Medicine, including medical anatomy, forensic medicine and public health. Part II, Surgery, including surgical anatomy and the use of surgical appliances. Part III, Midwifery and gynaecology. Candidates may take Sections I and II, and the three parts of Section II separately, or they may present themselves for the whole examination at one time. They will be required to produce evidence of having completed courses of study in pathology (including morbid anatomy and histology), *post-mortem* work, clinical pathology, bacteriology, clinical medicine, practical surgery (including mechano-therapeutics), forensic medicine, mental diseases, public health, anaesthetics, midwifery and gynaecology, applied anatomy and applied physiology, and operative surgery. Certificates of having received certain specified hospital instruction must also be presented. Re-examination in referred subjects cannot take place within three months of the date of rejection. The fees for this examination amount to £31 10s.

Special regulations are provided for cases in which students have passed examinations in certain subjects elsewhere. Synopses of the examination can be obtained from the Secretary of the Examining Board, 8-11 Queen Square, Bloomsbury, London, W.C.1.

SCOTTISH TRIPLE QUALIFICATION

The Royal Colleges of Physicians and Surgeons of Edinburgh, with the Royal Faculty of Physicians and Surgeons, Glasgow, grant three diplomas ("Triple Qual.") jointly entitling the holder to registration as a general medical practitioner. The four examinations are held in Edinburgh, Glasgow, or both cities. The course of study must occupy not less than five years, and the examination fees amount to £30. Full particulars may be obtained from Mr. D. L. Eadie, 49 Lauriston Place, Edinburgh, or Mr. W. Hurst, 242 St. Vincent Street, Glasgow.

IRISH DOUBLE QUALIFICATION

Particulars may be obtained on application to Mr. Alfred Miller, Royal College of Surgeons, Stephen's Green, Dublin.

LONDON APOTHECARIES' DIPLOMA

The Society of Apothecaries of London grants a diploma (L.M.S.S.A.) in medicine, surgery, and midwifery. There are two examinations, Primary and Final, and the course of study extends over five years. The fee for the Primary examination is £5 5s.; for the Final examination a fee of £21 is payable (£15 15s. if a fee of £5 5s. has been paid for the Primary examination). Application may be made to Mr. Frank Haydon, L.R.C.P. Lond., Secretary, Society of Apothecaries of London, Water Lane, E.C.4.

DUBLIN APOTHECARIES' DIPLOMA

The Apothecaries' Hall of Ireland grants a diploma (L.A.H.) to candidates who pass the requisite examinations. There are two examinations, with a fee of £21 for each. Particulars may be obtained from the Registrar of the Apothecaries' Hall, 95 Merrion Square.

Medical Schools

The following are the principal medical schools in the United Kingdom:—

LONDON

The following medical schools are constituents of the London University:—

Charing Cross Hospital Medical School, Chandos Street, W.C.2.—Dean, Dr. W. J. Fenton; Secretary, Mr. F. Noakes

Guy's Hospital Medical School, London Bridge, S.E.1. The fees for a five-years' course amount to approximately £245. Several scholarships are obtainable by students, and a residential college (facing the hospital) is open for those who desire such accommodation. Communications should be addressed to the Dean of the School.

King's College, Faculty of Medical Science, Strand, W.C.2.—Students are prepared for the first two medical examinations of the University of London or other universities, or the first two of the Conjoint Board. Fees:—First M.B. or conjoint course, £36 15s. per annum; second course, £42 per annum. Dean of the Faculty, Professor R. J. S. McDowall, M.B.

King's College Hospital Medical School, Denmark Hill, S.E.5.—Composition-fee for the University of London course or the Conjoint Board course, £210; this fee includes three years' tuition at King's College and three years' at the Hospital. Arrangements may also be made for payment by instalments. Several scholarships and prizes are available through examination. Dean, Dr. H. Willoughby Lyle. The School calendar, giving particulars as to fees, may be obtained on application to the Secretary, Mr. S. C. Ramer, M.A.

London Hospital Medical College, Turner Street, E.1.—Entrance-fee, £21; annual fee, £42. Several scholarships and prizes are open to competition. Dean, Professor W. Wright, M.B.; Secretary, Mr. E. J. Burdon.

London (Royal Free Hospital) School of Medicine for Women, Hunter Street, W.C.1.—Composition-fee (payable in five instalments) for the University of London M.B., B.S., or the Conjoint Board qualification, £240. Dean, Lady Barrett, M.D., M.S. A list of scholarships (total annual value, £1,100) and other particulars may be obtained from the Warden and Secretary, Miss L. M. Brooks, M.D.

Middlesex Hospital, Union Street, W.1.—The school, which includes the Bland-Sutton Institute of Pathology and the cancer-research laboratories, is fully equipped for teaching the entire medical curriculum; special courses are given in the higher degrees and diplomas, particularly the M.R.C.P., the Primary F.R.C.S. Eng. and Diploma in Public Health. Special attention is given to the co-ordination of the work in the laboratories with that in the wards. The rebuilding of the hospital is being carried out without any disorganisation of its clinics.

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Fees: Entrance-fee, £25; five annual instalments of £45; thereafter at the rate of £23 per annum until qualified. Scholarships and prizes exceeding in all £1,000 are awarded annually. A prospectus may be obtained, on application, from the Dean of the School, Dr. E. L. Pearce Gould. Secretary, Mr. R. A. Foley.

St. Bartholomew's Hospital and College, Smithfield, E.C.1.—Composition-fee, £231 (or five annual instalments of £50 8s. each). The total value of the scholarships and prizes awarded annually is over £1,200. Dean, Dr. T. W. Shore.

St. George's Hospital, Hyde Park Corner, S.W.1.—Composition-fee (first year), £36 15s.; (second to fifth years), £42 each. Courses in preliminary and intermediate subjects are taken at King's College. Entrance-scholarships are awarded annually, and there are several exhibitions and prizes. Dean, Dr. A. Feiling.

St. Mary's Hospital Medical School, Cambridge Place, W.2.—Composition-fee for the curriculum (time-limit six years), £200—if paid in four instalments, £210. Entrance-scholarships, together with several studentships and prizes, are awarded annually. Dean, Dr. C. M. Wilson; Secretary, Mr. B. E. Matthews, B.A.

St. Thomas's Hospital Medical School, Albert Embankment, S.E.1.—There are five entrance-scholarships; other prizes are open for competition throughout the student's career. Annual fee (payable at the beginning of each year), £50. Further information may be obtained from the Secretary, Dr. L. B. Maxwell.

University College Hospital Medical School, University Street, W.C.1.—The composition fee for the final degree or Conjoint Board examination course amounts to £123 7s. 6d. Several scholarships and exhibitions are offered by competition. Dean, Dr. A. M. H. Gray; Secretary, Mr. G. E. Adams.

Westminster Hospital Medical School, 12 Caxton Street, S.W.1.—Entrance-fee, £10 10s.; annual composition-fee (payable in advance), £40. Scholarships and prizes are awarded over a considerable period of the curriculum. Preliminary and intermediate studies are taken at King's College. Dean, Dr. A. S. Woodward; Secretary, Major J. Burke.

OUTSIDE LONDON

ABERDEEN.—*University Faculty of Medicine*.—The total cost of obtaining the M.B., Ch.B. degrees is estimated at £236, including hospital fees, class fees, and degree fees. Clinical study is available at the Royal Infirmary and other local institutions. Scholarships and bursaries are open to competition. Applicants should communicate with the Secretary to the University.

BELFAST.—*Queen's University of Belfast*.—Students are prepared, during a five-years' course, for the degrees of M.B., B.Ch., and B.A.O. The combined class and laboratory fee for four years is £105, payable in four instalments. Particulars may be obtained on application to the Secretary to the General Board of Studies.

BIRMINGHAM.—*University Faculty of Medicine*.—The minimum cost of obtaining the double degree is estimated at £201. Full information is obtainable at the Dean's Office, University Medical Buildings, Edmund Street.

BRISTOL.—*University Faculty of Medicine*.—The approximate cost of obtaining the conjoint degrees is £263, payable by annual instalments. The Faculty also prepares students for the diploma examinations of other licensing bodies; such students are not required to matriculate. Dean, Professor E. Fawcett, M.D.; Registrar, Mr. E. G. Francis, M.A.

CAMBRIDGE.—Clinical lectures and practical instruction are given, by arrangement with the University, at Addenbrooke's Hospital. Apply to Mr. E. Harrison, M.A., Registrar of the University, for particulars.

CARDIFF.—*The University College of South Wales and Monmouthshire* is a constituent college of the University of Wales. Composition-fees for six years amount to £200. Application for particulars may be made to the Registrar, University Registry, Cathays Park.

CORK.—*University College* is a constituent college of the National University of Ireland.

DUBLIN.—*Royal College of Surgeons' Schools of Surgery* are attached to the Royal College of Surgeons. A syllabus may be obtained from Mr. Alfred Miller, Registrar, Royal College of Surgeons, Stephen's Green.

School of Physic, Trinity College.—The total cost of qualifying amounts to £146 3s. Registrar, Mr. G. L. Allen, M.A.

University College.—A constituent college of the National University of Ireland.

DURHAM.—See "Newcastle-upon-Tyne."

EDINBURGH.—*University Faculty of Medicine*.—The fees for each subject range from £1 11s. 6d. to £7 17s. 6d. a session. A perpetual ticket for practice at the Royal Infirmary costs £12 in one payment, or £12 12s. if paid in instalments. Dean, Professor Lorrain Smith, M.D.

School of Medicine of the Royal Colleges.—The courses of study are suited to University and other qualifications. The minimum cost of education for the triple qualification, including examination fees, is about £170, payable by instalments. Scholarships and bursaries are available by competition. Communications respecting the school should be addressed to the Dean, Surgeons' Hall, Nicolson Street.

GALWAY.—*University College*.—A constituent college of the National University of Ireland.

GLASGOW.—*The University Faculty of Medicine*.—The division of studies is similar to that adopted at Edinburgh, and the fees are about equal. Dean, Professor Currie; Assistant Registrar of the University, Mr. R. Brough.

The Anderson College of Medicine, Dumbarton Road, W.—Students are prepared for University and other qualifications. A copy of the College calendar will be sent on receipt of a postcard addressed to the Secretary of the Medical Faculty at the College.

St. Mungo's College, 86 Castle Street.—The total fees payable for preparation for a Scottish or English qualification amount to rather more than £100. Secretary, Mr. T. B. Ferguson, 97 West Regent Street.

LEEDS.—*University Faculty of Medicine*.—The total cost of education for the M.B. degree is estimated at £300. Dean of the Faculty, Professor J. K. Jamieson.

LIVERPOOL.—*University Faculty of Medicine*.—The composition-fees for a degree course are estimated at £230, in addition to examination fees. Dean of the Faculty, Dr. W. J. Dilling.

MANCHESTER.—*University Faculty of Medicine*.—The fees for the training and examination for the M.B., Ch.B. degrees are estimated at £288 3s. Courses are also available for other degrees and diplomas. Particulars will be found in the calendar of the University, or may be obtained (price 3d.) on application from Professor J. S. B. Stopford, M.D., Dean of the Medical School (for classes), and the Registrar (for examinations).

NEWCASTLE-UPON-TYNE.—*University of Durham College of Medicine*, Northumberland Road.—A composition ticket for a complete course of lectures and laboratory work may be obtained by payment of £122 in advance, or at a slightly higher cost if purchased by instalments. For particulars of the courses of instruction, apply to Professor R. Howden, Registrar of the College.

OXFORD.—Courses of practical instruction are given, by arrangement with the University, at Radcliffe Infirmary. Apply to the Dean of the School of Medicine (Dr. E. W. Ainley Walker), University Museum, for particulars as to the curriculum.

ST. ANDREWS.—*University Faculty of Medicine*.—The inclusive fee for five-years' University and clinical courses for the M.B., Ch.B. degrees is £182, payable in instalments. Advisers of Studies, Professor J. Charteris, M.D., Dundee, and Professor D. Waterston, M.D., Bute Medical Buildings, St. Andrews.

SHEFFIELD.—*University Faculty of Medicine*.—A five-years' course is provided for. The composition-fee is £190, payable in five instalments. Dean, Professor J. S. C. Douglas; Registrar of the University, Mr. W. M. Gibbons, M.A.

SWANSEA.—*University College*.—A constituent college of the University of Wales. Registrar, Mr. Edwin Drew.

Educational Information

Dentistry

Dentists, like medical men, are under the control of the General Medical Council with regard to curriculum and also in the matter of removal from the Dentists' Register for unprofessional conduct. An official "memorandum" by the Registrar of the Dental Board of the United Kingdom, published last May (1s.), sets forth clearly the functions of the Council and of the Board, and gives estimates of the cost of obtaining degrees or diplomas. A course of instruction and training for a degree usually occupies five years, and a diploma course four years. The Board, which is in a strong position financially, has instituted a system of bursaries for the purpose of helping students who are not able to afford the cost of qualifying. The Preliminary examination is of the same standard as in medicine. With the extension of dental benefits to National Health Insurance patients and the demands of the public services, there is ample scope for newly qualified dentists. For some kinds of practice it is advantageous to take a medical diploma simultaneously with the qualification in dental surgery.

Dental Training

The registration of dental students is subject to the following conditions:—The candidate must (1) be not less than seventeen years of age, (2) have passed a recognised Preliminary examination (see "Preliminary Examinations" under "Medicine") and a Pre-registration examination, and (3) have commenced professional study, by pupillage or otherwise. Candidates for a diploma in dental surgery should produce certificates of having been engaged during four years in professional study, and of having received two years' instruction in mechanical dentistry. (A syllabus for students in dental mechanics is issued by the British Dental Association, 23 Russell Square, London, W.C.1.) No portion of practical instruction which is taken prior to the date of registration may be reckoned as a portion of the four years of professional study. It is recommended that instruction in dental mechanics be taken at recognised dental hospital and school. If any part of such instruction is taken by the candidate as a pupil with a registered dentist, the time required to be devoted to it shall be at least twice the time required for the corresponding instruction taken at a dental school. Application for registration should be made on the appropriate form to the Registrar of the General Medical Council, 44 Hallam Street, London, W.1. No fee is charged for registration as a student. Examination for a degree or licence in dentistry or dental surgery includes the following subjects:—

(1) *Chemistry, Physics, and Biology*, in their bearing on medicine and dentistry; (2) *Human Anatomy and Physiology*; (3) *General Pathology*, including bacteriology; (4) *Medicine and Surgery*; (5) *Dental Anatomy and Physiology*, *Dental Pathology*, *Dental Surgery* (including orthodontics), *Dental Materia Medica and Therapeutics*, and *Dental Mechanics and Dental Metallurgy*; (6) *Practical Dental Surgery*; (7) *Practical Dental Mechanics and Metallurgy*; (8) *Anaesthetics*, general and local, employed in dental practice.

Women are not admitted, at present, as students to certain of the dental schools and general hospitals. The L.D.S. of the Royal College of Surgeons of England is more valued than a similar qualification obtained elsewhere. The curriculum of the College (the Preliminary and Pre-registration examinations having been passed) is as follows:—

The *First Professional Examination* consists of (1) dental mechanics, (2) dental metallurgy, and (3) (a) general anatomy and physiology, (b) dental anatomy and physiology, and is held three times a year. Candidates may present themselves for the several parts of the First Professional examination together or separately, but before admission to any part of the examination they must produce evidence of having passed the required Preliminary examination in general education and the required Pre-registration examination or a certificate of having been registered as a medical or dental student. Candidates for Part 1 must give twenty-one days'

notice in writing, and forward certificates of having been engaged during a period of not less than two years in acquiring a practical familiarity with the details of dental mechanics and of having attended courses of lectures and practical work. They must also provide themselves with certain instruments. Similar regulations apply to Parts 2 and 3.

The *Second Professional Examination* consists of (1) general surgery and pathology, (2) dental surgery and pathology, and practical dental surgery. Four months must elapse between Part 1 of this and the first examination, and certificates of attendance at certain courses must be produced. Before admission to Part 2, candidates must be certified as having attended studies at a recognised institution for two years.

The fees for the pre-registration and diploma examinations amount to £24 3s., payable by instalments. Inquiries should be addressed to the Director of Examinations (Mr. F. G. Hallett), Examination Hall, Queen Square, London, W.C.1. Similar conditions apply to the qualifications of the following colleges:—

ROYAL COLLEGE OF SURGEONS, EDINBURGH.—The course of study must occupy at least four years, and not less than three years must be spent at a recognised school. The subjects are taken in two examinations. The examination fees amount to £15 15s. Information may be obtained from Mr. D. L. Eadie, Clerk to the College, 49 Lauriston Place.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS, GLASGOW.—The general regulations are similar to those obtaining at Edinburgh. Candidates for the licence must be twenty-one years of age. The fees, including that for the Registration examination, amount to £19 19s. Particulars are obtainable from Mr. W. Hurst, Secretary of the Faculty, 242 St. Vincent Street.

ROYAL COLLEGE OF SURGEONS IN IRELAND, Stephen's Green, Dublin.—The Registrar will furnish particulars on application.

University Degrees and Diplomas

BELFAST.—Five years' study is compulsory for students for the degree of B.D.S., and four years' for candidates for the licence diploma. Examination and degree fees, amount to £22 1s.; examination and diploma fees to £15 15s. Regulations and other information may be obtained from the Secretary to the General Board of Studies, Queen's University.

BIRMINGHAM.—The course for the diploma (L.D.S.) occupies four years, three of which must be University years; that for the B.D.S. degree covers five years. The B.D.S. degree (examination and admission fees, £40 7s.) cannot be conferred until twelve months after the diploma (or that of an approved body) has been obtained. Dean of the Dental Hospital, Mr. C. H. Howkins, M.R.C.S., L.D.S.; Registrar of the University, Mr. J. H. Costain, M.A.

BRISTOL.—The curriculum for the degree extends over five years, with exemptions in favour of students holding an approved certificate in certain subjects. Study for the diploma must occupy four years. There are four examinations for the degree and four for the diploma, the fees amounting respectively to £30 8s. and £23 2s. Registrar, Mr. E. G. Francis, M.A.

DUBLIN.—Four and a half years must be spent in study for the degree of bachelor in dental science and the B.A. degree. Details may be obtained from the Registrar of the School of Physic, Trinity College, Dublin. (See also "Ireland.")

DURHAM.—The University grants a licence and a degree in dental surgery. The diploma course occupies four years, and the degree course five years. Fees for examinations and licence, £23 13s. Fees for examinations and B.D.S. degree, £28 3s. Particulars may be obtained on application to the Secretary of Examinations, Durham College of Medicine, Newcastle-upon-Tyne.

IRELAND.—The course of study for the B.D.S. degree of the National University of Ireland extends over four years, and there are four examinations. Constituent colleges, Dublin, Cork and Galway. (See also "Dublin.")

LEEDS.—There are three examinations, in addition to a prescribed course of study extending over five years

Educational Information

for the degree and four years for the diploma. The matriculation, examination and degree fees together amount to £25. Dental Warden, Mr. W. S. Thornburn, L.D.S.; Registrar of the University, Mr. A. E. Wheeler, M.A.

LIVERPOOL.—There are four examinations for the degree of B.D.S. or for the licence in dental surgery (L.D.S.). Four years' study is required for the licence and five years for the degree. Total degree fees, £24. Dean of the Medical Faculty, Dr. W. J. Dilling.

LONDON.—The degree of B.D.S. is conferred after matriculation and four subsequent examinations. The curriculum extends over five years, and the examination fees amount to £30 9s. For particulars apply to the External Registrar (if an external student), University of London, South Kensington, S.W.7.

MANCHESTER.—The examination fees for the B.D.S. (four examinations), together with the conferment fee, amount to £30 7s. The curriculum extends over five and a half years. The diploma course covers four years, with examination and conferment fees amounting to £23 2s. Inquiries regarding examinations should be addressed to the Internal Registrar of the University.

ST. ANDREWS.—The University grants a diploma in dental surgery (L.D.S.), after four years' study and four examinations. Combined fees, £20 9s. 6d. For particulars apply to the Dean, Dental Hospital, Park Place, Dundee.

SHEFFIELD.—Five and a half years' study is required for the degree (B.D.S.), and four years' for the diploma. There are three examinations for each. Total fees, respectively, £22 and £20. Registrar of the University, Mr. W. M. Gibbons, M.A.

Dental Instruction

The following are the chief schools in the United Kingdom for instruction in the science and practice of dentistry:—

LONDON.

Guy's Hospital Dental School, London Bridge, S.E.1.—Practical training is provided in the hospital. The cost of a five years' course for the B.D.S. degree of London University is £339 8s. Cost of L.D.S. training (four years), £280. The course can be extended so as to include medical studentship. The cost of the combined medical and dental course is approximately £440. Particulars may be obtained from Professor T. B. Johnston, M.B., Dean of the School.

King's College, Strand, W.C.2.—The authorities of King's College and those of King's College Hospital have recently established a dental school. Under the new scheme the College provides tuition in science, including metallurgy, anatomy, physiology, and pharmacology. Dean of the Faculty of Medicine, Professor R. J. S. McDowall, M.B.

King's College Hospital Dental School, Denmark Hill, S.E.5.—Professional instruction is given in association with King's College. Dental students may also attend other departments bearing on their work—e.g., those devoted to diseases of the throat. A London degree course costs £274, and a diploma course £256. Director of Dental Studies, Mr. Alexander Livingston, M.B.; Secretary of the School, Mr. S. C. Ranner, M.A.

London Hospital Dental School, Turner Street, E.1.—Full course (including dental mechanics) for L.D.S. diploma, £240. Six years' course for medical and dental qualifications, £360. Inquiries should be addressed to the Dean (Professor W. Wright, M.B.).

London (Royal Free Hospital) School of Medicine for Women, Hunter Street, W.C.1. Students can pursue that part of the dental course not taken at the Royal Dental Hospital of London. Composition-fee for (1) B.D.S. Lond., £140, payable by instalments, and subject to a deduction of £20 if chemistry and physics have been passed before entry; (2) L.D.S.R.C.S., £80, payable by instalments, and subject to a corresponding deduction of £15. Dean, Lady Barrett, M.D., M.S.; Warden and Secretary, Miss L. M. Brooks.

Middlesex Hospital Medical School, Union Street, W.1.—The hours of lectures and classes are arranged to fit in with courses of instruction at the Royal Dental Hospital of London. The dental and medical courses can to a great extent be taken simultaneously; in addition, special classes are arranged for dental students only. The fee for the course for the Final examination only is £21. Dean, Dr. E. L. Pearce Gould; Secretary, Mr. R. A. Foley.

Royal Dental Hospital of London School of Dental Surgery, Leicester Square, W.C.2.—The cost of the full course, including the fee at a general hospital and examination fees for the L.D.S. diploma, is estimated at £315. School fees for the London B.D.S. degree amount to £372 5s. Particulars of several scholarships are given in the calendar of the School. Dean, Mr. H. Stobie.

St. Bartholomew's Hospital (Dental Department), Smithfield, W.C.1.—Courses of demonstrations are given. Composition-fee for general subjects, £126. Dean of the Medical College, Dr. T. W. Shore.

St. Mary's Hospital, Paddington, W.2.—A composition-fee of £73 10s. is charged for a two-years' course if paid on entry. Dean of the Medical School, Dr. C. M. Wilson; Secretary, Mr. B. E. Matthews, B.A.

University College Hospital Dental School, Great Portland Street, W.1.—Composition-fees: L.D.S. dental course, £246; six-years' course, comprising dental curriculum and curriculum for the M.R.C.S., L.R.C.P. diplomas, £416, payable by instalments. Sub-Dean, Mr. I. L. Dudley Buxton, L.M.S.S.A., L.D.S.

Westminster Hospital, 12 Caxton Street, S.W.1.—Fee for general surgical practice and lectures for the R.C.S. dental diploma (payable in advance), £70 (or two payments of £36 each). Dean of the Medical School, Dr. A. S. Woodwark.

OUTSIDE LONDON

BELFAST.—**Queen's University Faculty of Medicine.**—The combined class and laboratory fee is £23 12s. 6d. for the first year, and £26 5s. for the second year. Entrance-forms and other information may be obtained by applying to the Secretary to the General Board of Studies.

BIRMINGHAM.—**University School of Dentistry.**—The courses of instruction qualify for the diplomas in dental surgery of all licensing bodies, as well as for the degrees and diploma of Birmingham University. The cost of preparation for the B.D.S. degree and the L.D.S. diploma is estimated at £252 and £225 respectively. Dean of the Dental Hospital, Great Charles Street, Mr. C. H. Howkins, M.R.C.S., L.D.S.

BRISTOL.—**University Faculty of Medicine (Dental Surgery).**—The inclusive cost of the curriculum is estimated at £273 8s. in the case of the degree, and £250 7s.

TO QUALIFY AS A DENTIST

- (1) Pass recognised preliminary and pre-registration examinations.
- (2) Register as a student at the Dental Board Office, 44 Hallam Street, London, W. 1. Instruction in mechanical dentistry may be taken prior to registration.
- (3) Take a four or five years' curriculum as provided in the regulations.
- (4) Pass, at proper intervals, the requisite examinations for the degree or diploma sought.



Educational Information



for diploma students. Registrar of the University, Mr. E. G. Francis, M.A.

DUBLIN.—*School of Dental Science, Trinity College.*—The total cost of obtaining the B.Dent.Sc. degree is given in the regulations as £331 15s. 6d., including arts and dental courses and examination and degree fees. For details, apply to the Registrar of the School of Physic.

Royal College of Surgeons Schools.—The College grants a diploma in dental surgery. Cost of tuition, £211; examination fees, £28 7s. Registrar, Mr. Alfred Miller.

DUNDEE.—*Dundee Dental School, Park Place.* Dean, Mr. W. G. Campbell, M.B., C.M., L.D.S. (See also "St. Andrews.")

EDINBURGH.—*School of Medicine of the Royal Colleges.*—Communications should be addressed to the Dean of the School, 11 Bristo Place.

Incorporated Dental Hospital and School, 31 Chambers Street.—Hospital practice and clinical instruction are taken at the Royal Infirmary. The tuition and R.C.S. Edin. diploma fees amount to £190. If the "triple qualification" (see "Medicine") is taken concurrently, the minimum cost is £202 8s. 6d. Dean of the School, Mr. W. Guy, F.R.C.S., L.D.S.; Secretary, Mr. G. M. Stuart, W.S., 20 York Place.

GLASGOW.—*Incorporated Dental Hospital and School, 158 Renfrew Street.* Estimated cost of curriculum and licence examinations, £241 10s., plus £90 for instruments and books. Communications regarding the School should be addressed to the Dean, 15 Dalhousie Street.

LEEDS.—*Dental Department of the University.*—The cost of education for the degree of the University is given in the University Calendar as £261 (£243 for the diploma). Registrar of the University, Mr. A. E. Wheeler, M.A.

LIVERPOOL.—*University School of Dental Surgery.*—Candidates are prepared for the licence (L.D.S. Liverpool), the degree of B.D.S., and the higher degree of M.D.S. School fees for the B.D.S. (five years' training) amount to £250; those for the L.D.S. (four years' course) to £193. Director of Dental Education, Professor W. H. Gilmour, M.D.S.

MANCHESTER.—*Dental Department of the University.*—Students are prepared for the B.D.S. of the University, the diploma of the University, or the L.D.S. diploma of the R.C.S. Eng. The tuition fees for the degree of B.D.S. amount to £283, and those for the University diploma to £250 9s. 6d., payable in instalments. The Dean of the Medical Faculty of the University answers inquiries concerning classes.

Dental Hospital of Manchester, Oxford Road, The University, and Manchester Royal Infirmary.—The total fees payable to the University, the Hospital, and the Infirmary for courses of study, chemicals, apparatus, examinations, and the conferment of the degree or diploma are approximately as follows: For the B.D.S. Manch., £311; for the L.D.S. Manch., £239; for the L.D.S., R.C.S. Eng., £250. The required outfit in each case costs about £47 in addition. Dean of the Dental Hospital, Mr. J. H. Mathews, L.D.S.

NEWCASTLE-UPON-TYNE.—*University of Durham College of Medicine (Dental Department).*—For particulars apply to Professor R. Howden.

Dental Hospital and School, Handyside's Buildings, Percy Street.—Composition-fee for dental lectures, demonstrations, and hospital practice, £60 4s. Dean, Mr. J. Coltman.

ST. ANDREWS.—Courses of instruction are available at (1) the Medical School, University College, Dundee; (2) the Royal Infirmary, Dundee; and (3) the Dental Hospital, Dundee. (See "Dundee.")

SHEFFIELD.—*Dental Department, University Faculty of Medicine.*—Students are prepared for the degree (composition-fees, £225, payable by instalments) or the diploma (composition-fees, £200) of the University. Courses extend to five and a half and four years respectively. Registrar, Mr. W. M. Gibbons, M.A.

Science

The possession of a degree or diploma in chemical science, as proof of study or practical training, is at the present time usually required in every case of those who apply for posts in the several branches of chemical industry. The student who decides to proceed to some qualification in chemical science must decide at the outset of his studies to which branch of the subject he will devote himself. There is a strongly marked line between pure (academic) science and the requirements of industrial chemistry. The holder of a degree in pure science almost invariably joins the ranks of the teaching profession or takes up research, though monetary reward in the latter case is not to be looked for as a certainty. The technical chemist, on the other hand, has more chance of commercial success than the holder of a purely academic qualification, but in this case specialisation in one branch of the subject is necessary. Holders of pharmaceutical qualifications, provided they can comply with curriculum conditions, usually find little difficulty in the examinations in science or technology.

Royal Scholarships carrying free instruction and maintenance allowance of £60 per annum and Free Studentships are awarded annually as a result of science examinations held by the Board of Education. The Board of Education also holds examinations each year for Whitworth Scholarship and Exhibition, the former being of a value of £125 per annum and tenable for three years, and the latter is worth £50 for one year. Local Exhibitions with free tuition and maintenance allowance (from £50 to £80 a year) are also awarded by the Board of Education in conjunction with local education authorities. Tuition is in all cases at the Royal College of Science, South Kensington. Science students can obtain details of these valuable awards at their local training college. The Salters' Institute awards grants-in-aid to employees (over seventeen years old) in chemical works in or near London who desire to extend their education in chemical industry. Fellowships for research, value from £250 to £300, are offered annually. Applications for grants and fellowships should be sent in early in June to the Director, Salters' Institute of Industrial Chemistry, St. Swithin's Lane, London, E.C.4. A training in pharmacy is essential for appointments in laboratories of wholesale druggists and hospital dispensaries, but the holders of these positions are all pharmaceutical chemists who have degrees in science or other qualification as analysts.

Preliminary Standards

It is an advantage for the student in science to pass the London University Matriculation examination or an examination of entrance standard to the Universities of Great Britain and Ireland. For particulars of the London Matriculation apply to the External Registrar, University of London, South Kensington, S.W.7.

A list of preliminary examinations approved by the Institute of Chemistry is obtainable on application to the Registrar, 30 Russell Square, London, W.C.1. These include the University Matriculation examinations, entrance examinations of recognised colleges, and examinations of certain educational bodies, such as the Senior certificate of the College of Preceptors. The compulsory subjects must be passed at one examination, but in certain circumstances the Council of the Institute of Chemistry accepts evidence that the subjects have been passed in two examinations. A University Matriculation examination has the advantage of allowing the student to progress to a science degree, and it is very usual to take both qualifications.

Science Degrees

The regulations for a degree in science of London University require the student to pass three examinations, viz.:—(1) The Matriculation, (2) the Intermediate examination in science, and (3) the Final examination. Regulations are published for (a) internal students who

Educational Information

register as such and follow approved courses of instruction, and (b) external students who are examined without complying with a curriculum.

The Intermediate Examination in Science commences on the first Monday in July. An additional Intermediate examination will be held, in London only, for external students, commencing on the fourth Monday of November. A candidate must have passed the Matriculation examination not later than the preceding January or June, respectively, or otherwise have fulfilled the conditions of exemption. Candidates are required to pass in any four subjects selected by themselves out of the following: (1) Pure mathematics; (2) applied mathematics; (3) physics; (4) chemistry; (5) geology; (6) botany; (7) zoology; (8) the general principles of biology; (9) military studies; (10) geography. At least one of the four subjects selected must be taken from among the first three. The fee is £6 6s. Candidates enter for a pass at both examinations, but may take honours in the June examination.

The Final examination for B.Sc. takes place once a year, commencing on the third Monday prior to the first Monday in July. The B.Sc. degree is obtainable by passing the B.Sc. degree (general) examination in three subjects, or taking the B.Sc. degree (special), an examination of a specialised nature in a principal subject and a subsidiary subject. Successful candidates will be awarded First-class Honours, Second-class Honours, or a Pass Degree. An additional general examination is also held, commencing the first Monday in November in the more ordinary subjects. Candidates must have passed the Intermediate at least a year previously, and the Matriculation at least three years previously. The fee is £6 6s. There are fourteen prescribed subjects to select from. The degrees Master of Science (M.Sc.), Doctor of Philosophy (Ph.D.), and Doctor of Science (D.Sc.) are also granted. The English provincial, Irish Scottish and Welsh universities confer the B.Sc. degree (*cum curriculo*), usually three years after matriculation, with examinations at the end of each session. The degrees are granted in various branches—e.g., botany, chemistry, mathematics, or physics. At Manchester and Glasgow the degree can be taken in pharmacy.

Diplomas for Analytical Chemists

The Institute of Chemistry of Great Britain and Ireland (30 Russell Square, London, W.C.1) conducts periodically examinations for the associateship of the Institute (A.I.C.). A certificate in Branch E (analysis of food and drugs, and water, etc.) is nowadays a necessity to obtain an appointment as a public analyst, and this branch is attractive to would-be pharmacist associates on account of their special knowledge of pharmacognosy and therapeutics. The Regulations for the admission of students, associates and fellows are obtainable from the Registrar of the Institute.

STUDENTSHIP.—Candidates should register at the Institute (see above) as students at the commencement of their training. They must be British subjects, not less than sixteen years of age, and have passed an approved preliminary examination, and at the time of application be recommended by a teacher of chemistry at a recognised institution, or a Fellow of the Institute. In the last case an annual report of progress is required. Annual registration-fee, 10s.

ASSOCIATESHIP.—The Examination for Associateship (A.I.C.) consists of general theoretical chemistry (three papers) and practical chemistry, and occupies six days. Fee, £5 5s. It is open to: (i) Candidates who have completed four years' systematic day course of study in prescribed subjects at a recognised university or college; (ii) candidates who in lieu of first year above under (i) have taken two years' full-time study at a secondary school recognised by the Board of Education or had two years' experience in the laboratory of a Fellow of the Institute; (iii) candidates who in lieu of a fourth year have had one year's satisfactory experience under a Fellow or in an approved laboratory or works; (iv) candidates who have obtained a university degree, including chemistry in the subjects, and have taken a further year's training in chemistry at a university or college or have had two other years' approved experience under a Fellow of the Institute or in an approved laboratory or works. (v) Applications from candidates (over 25 and with at least eight years in practice) who do not comply with the above requirements are also considered.

The synopsis of the examination for the associateship is as follows:—

SCIENCE QUALIFICATIONS

(IN BRIEF)

B.Sc. LONDON DEGREE

1. Pass Matriculation.
2. Intermediate Examination in Four Science Subjects selected out of Ten. Fee £6 6s.
3. Final Examination taken at least one year afterwards. Fee £6 6s.

F.I.C. DIPLOMA

1. Pass approved Preliminary Examination and register as Student while training with recognised instructor. Annual Fee 10s.
2. After 4 years' day training, Examination for Associateship. Fee £5 5s.
3. After a further three years an Examination for Fellowship in a specified branch. Entrance fee £5 5s.

(a) *General Theoretical Chemistry.*—Candidates are required to show a thorough acquaintance with the fundamental laws and theories of chemistry, together with the properties and the methods of preparation of the elements and of their compounds, both inorganic and organic, and with the application of chemistry in the arts and industries. Three papers, any of which may contain questions in inorganic, organic and physical chemistry, will be set.

(b) *Practical Chemistry.*—Exercises in qualitative analysis and quantitative analysis (both gravimetric and volumetric), including the analysis of alloys, ores, and minerals, and the determination of substances present in minute quantities, as impurities or otherwise, in commercial products. Preparation and purification of well-defined chemical substances. Organic analysis, including the recognition and determination of the elements and of typical groups and radicals, the identification of organic compounds. Gas

analysis. The determination of physical constants and the use of physical instruments employed by chemists.

Candidates are required to satisfy the examiners as to their ability to translate technical literature from French and German into English with the aid of dictionaries.

Admission to the associateship without further examination may be granted to candidates who have obtained certain university degrees with first or second class honours in chemistry, or other diplomas recognised by the Council, with certain limitations as to courses of instruction and training.

FELLOWSHIP.—Admission to the Fellowship is open by examination to associates of three years' standing, who are not less than twenty-four years of age. Only in exceptional circumstances will the Council of the Institute consider applications from Associates for election to the Fellowship without examination; and such an Associate will be required to produce satisfactory evidence that (i) he has carried out original research; or (ii) he has devised processes or inventions of sufficient merit; or (iii) that he is possessed of knowledge and ability equivalent to having fulfilled the conditions contained in (i) and (ii).

The Fellowship examination (fee for Associates, £5 5s.) is more specialised, there being various branches for which the candidates may enter. These are: (A)

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inorganic chemistry; (B) physical chemistry; (C) organic chemistry; (D) agricultural chemistry; (E) the chemistry (including microscopy) of foods and drugs and water; (F) bio-chemistry; (G) chemical engineering; and (H) general chemistry.

Science Schools

Courses of science instruction are available at the following institutions. These in general cover the subjects for London science degrees, courses for the National Certificates in Chemistry awarded by the Board of Education (as to which Rules No. 100, price 2d., is obtainable at the Stationery Office), and for the Institute of Chemistry examinations. The student should ascertain from the secretary of the institution whether the courses available cover the specific curricula for the examinations he intends to enter:—

ABERDEEN.—*University.*—Degree courses in science. Approximate cost of B.Sc. curriculum, £110. *Robert Gordon's Technical College* includes a well-equipped chemical department. Day classes, £5 per term; evening classes, £1 10s. per session.

ABERYSTWYTH.—*University College of Wales.*—Three or four years' courses for degree in science, £20 per session (with practical work). Registration fee, £1 annually.

BANGOR.—*University College of North Wales.*—Composition fees for a science student amount to £24 1s. per session, including registration and apparatus fees.

BARNSELY.—Day courses for B.Sc. degree of Sheffield University, and in fuel or glass technology; £10 10s. per session.

BARROW-IN-FURNESS.—*Technical College, Abbey Road.*—Day and evening classes in chemistry, physics, and botany are available; fees per session, day classes £3 3s., evening classes from 7s. 6d.

BELFAST.—*Queen's University.*—Class fees in the University's science degree courses, from £1 1s. to £3 3s. each subject. *Municipal Technical Institute.*—For particulars of the science courses apply to the Principal.

BIRMINGHAM.—*University.*—Inclusive tuition fee for B.Sc. curriculum in pure science (including chemistry), £30 per session. *Municipal Technical School, Suffolk Street.*—Evening classes in chemistry, botany, and physics. *Aston Technical College.*—Day and evening courses in chemistry and physics; sessional fees, day £1 to £4, evening 12s. 6d.

BLACKBURN.—*Municipal Technical School.*—Day and evening classes are available in chemistry, physics, and botany.

BOLTON.—*Municipal Technical College.*—Evening courses in chemistry; fees, 5s. to 10s. per session.

BOURNEMOUTH.—*Municipal College.*—Science courses for B.Sc. London degrees, £17 17s. per session (three terms, day classes). Evening classes in science and technology, 12s. 6d. to £1 per session of two terms.

BRADFORD.—*Technical College.*—Day and evening courses for University of London degree examinations.

BRIGHTON.—*Municipal Technical College.*—Day courses for University of London examinations, including the new B. Pharm. degree; fees, £24 per session.

BRISTOL.—*University.*—Degree courses for B.Sc.; fee, £31 10s. per annum; M.Sc., Ph.D., and D.Sc. *Merchant Venturers' Technical College.*—Courses in chemistry, physics, and botany.

BURNLEY.—Day and evening classes are held at the Municipal College in chemistry and physics; fees, £1 to £3 8s. per course.

BURY.—Evening chemistry courses (extending over three years), cost 10s. to 15s. per session.

CAMBRIDGE.—*University.*—For particulars apply to the Registrar.

CARDIFF.—*University College of South Wales and Monmouth and Technical College.*

CORK.—*University College.*—A constituent college of the National University of Ireland.

DARLINGTON.—*Technical College.*—Evening courses in chemistry, 15s. to 25s.

DERBY.—*Technical College.*—Classes in chemistry, botany, and physics.

DUBLIN.—*College of Science for Ireland.*—Similar to the Imperial College in South Kensington. Four years' course for A.R.C.Sc.I. in chemistry (pure and applied) and other branches; fee £15 to £20 per annum. *Trinity College.*—Apply to the Registrar. *University College (National University of Ireland).*

DUNDEE.—*University College.*—Day classes in botany, chemistry and physics. *Technical College.*—Central institution for eastern counties of Scotland for technical instruction.

EDINBURGH.—*University.*—Degree courses for B.Sc.; inclusive fees, pure science, £105; technical chemistry, £126. *Heriot-Watt College, Chambers Street.*—Day courses for the examinations of the Universities of Edinburgh and London, and of the Institute of Chemistry, including also courses extending over four years for the Diploma of the College in applied chemistry. Fees range from £20 to £31 10s. Evening classes are also held from October to March.

EXETER.—*University College.*—Degree course in science. Fees, £25 per annum.

GALWAY.—*University College.*—A constituent college of the National University of Ireland.

GLASGOW.—*University.*—Degree courses in science. *The Royal Technical College.*—The day and evening classes include chemistry, technical chemistry, physics, botany, and bacteriology.

HALIFAX.—*Municipal Technical College.*—Day courses in chemistry, physics, and dyeing, £15 per session; evening classes, 13s. 6d. per subject.

HUDDERSFIELD.—*Technical College.*—Full-day and evening courses in chemistry, physics, botany, and technological subjects, including manufacture of dyes. Courses for Institute of Chemistry's examinations. Sessional fees: Day, £12 12s. to £21; evening from 10s. 6d., according to requirements.

HULL.—*Municipal Technical College, Park Street.*—Day, B.Sc. (Lond.) course, £2 2s. to £10 per term; also afternoon and evening classes in chemistry and physics.

LANCASTER.—*The Storey Institute.*—Evening or day classes in applied science; fees, 5s. to 10s. per session.

LEEDS.—*University.*—Degree courses in science; £33 per session. *Central Technical School, Cookridge Street.*—Evening classes in chemistry.

LIVERPOOL.—*University.*—Composition-fees for degree courses (three subjects and practical work) at £40 a session.

LONDON

Imperial College of Science and Technology, South Kensington, S.W.7.—This is a national institution, and comprises the Royal College of Science, the Royal School of Mines, and the City and Guilds (Engineering) College. The students include many who have gained science scholarships in the examinations conducted under the Board of Education (see p. 336). Government chemists are also trained at the Royal College, and private students are received also. The college provides "the highest specialised instruction, with the fullest equipment, for the most advanced training and research in various branches of science, especially in its application to industry." Entrants should have passed the Matriculation examination of the London University or its equivalent or the Entrance examination of the College. The courses of instruction extend to three years at least. The fees amount to £62 10s. per session; and there are several scholarships and prizes. The diploma of A.R.C.S. (Associate of the Royal College of Science) is granted in biology, botany, chemistry, geology, mathematics, mechanics, physics, and zoology; of A.R.S.M. after four years' training in mining, metallurgy, and the technology of oils, etc.; and of A.C.G.I. after three years' study in engineering. In all cases examinations are held in each academic year on the work of the year. The diploma of the Imperial College of Science and Technology (D.I.C.) is also awarded on suitable research work. The University of London now accepts the College examinations for the B.Sc. (special) and B.Sc. (engineering) examinations.

Battersea Polytechnic, Battersea Park Road, S.W.11.—Complete day and evening courses in chemistry, chemical engineering and chemical technology. Fees, £18 per session for day students. There are also special evening classes in bacteriology, oils, fats and waxes, technology of waxes, mineral oils and waxes, lubricating oils and greases, paper making and testing, flour milling, analysis and microscopy of food and drugs; and "Recognised" evening B.Sc. Courses. Fee, £1 to £1 10s. per session.

Birkbeck College, Breams Buildings, Chancery Lane, E.C.4.—Complete evening courses for University of London science degrees and other examinations in science. Composition-fees for Intermediate or Final science examination, £5 per term, or £12 per session.

Borough Polytechnic Institute, Borough Road, S.E.1.—A series of technical lectures on essential oils, by Mr. C. T. Bennett, B.Sc., Ph.C., commences in the autumn, and includes practical work. Foodstuffs, electro-chemistry and laundry materials are the subjects of other courses. Chemistry classes are also held, beginning in September; fees, 5s. to 10s. per session.

East London College, Mile End Road, E.1.—Classes in chemistry, mathematics, physics and botany. Intermediate, Final and Honours B.Sc., the B.Sc. Pharm. of London

Educational Information

University, and courses for the diplomas of the Institute of Chemistry. Fee, £22 10s. per annum.

King's College, Strand, W.C.2.—Courses are available in the Faculty of Natural Science for students preparing for B.Sc. degree and Institute of Chemistry examinations. Annual fees: Intermediate course, £36 15s.; Final course, £52 10s.

Northern Polytechnic, Holloway, N.7.—The composite fees for the Intermediate and Final B.Sc. courses are: Day, £18 per session; evening, £3 per session. Evening classes in chemistry, botany, physics and photography cost from 10s. to £3 per session.

Royal Holloway College, Englefield Green, Surrey.—For women students only, mainly residential. The college is a school of the University of London, and the degree courses include science. Fees: Residential students, £135 per annum; non-residential, £45 per annum.

Sir John Cass Technical Institute, Jewry Street, Aldgate, E.C.3.—Evening courses in chemistry, physics, mathematics, microbiology, brewing, painting, botany and vegetable physiology, metallurgy, mining and petroleum technology. Sessional fees (September to July): 20s. one evening per week, 35s. two evenings per week, plus 10s. for each additional evening per week.

South-Western Polytechnic, Manresa Road, Chelsea, S.W.3.—Day and evening courses in chemistry and botany. Fees for the B.Sc. course: Day, £15; evening, £3 per session. Classes are also held on food and drugs analysis.

University College, Gower Street, W.C.1.—Fees for three years' B.Sc. course, including chemistry, £147.

Wandsworth Technical Institute, High Street, Wandsworth, S.W.18.—Evening classes in chemistry, physics and botany. Fee for a recognised course, 15s. a session.

West Ham Municipal College, Romford Road, E.15.—Evening and day classes in chemistry, physics and botany, for B.Sc. London, etc. Inclusive fee, 14s. to 28s.

MANCHESTER.—Victoria University.—Composition-fee for B.Sc. degree in science, £42 to £44 2s. per session. Classes in bacteriology are held in the University in connection with the Department of Bacteriology and Preventive Medicine, York Place. Pharmacists are admitted to the elementary courses in bacteriology. Applications to Mr. W. W. C. Topley, M.A., M.D., Professor of Bacteriology and Director of the Public Health Laboratory. **College of Technology** also provides specialised instruction in applied chemistry. A degree of Bachelor of Technical Science (B.Sc. Tech.) is now obtainable.

NEWCASTLE-UPON-TYNE.—Armstrong College.—Tuition fees for degree course in pure science, £35 per annum.

NORWICH.—Technical Institute.—Day classes are held in chemistry and physics, and there are evening classes for botany, chemistry and physics.

NOTTINGHAM.—University College.—London University B.Sc. course; fee, £31 10s. per session. Evening classes in chemistry, physics and botany.

OXFORD.—University.—For particulars apply to Registrar. **Technical School.**—Fee for evening chemistry classes, 10s. per annum.

PLYMOUTH AND DEVONPORT.—Technical College.—Day and evening courses of B.Sc. Lond. Sessional fees: Day, £15 to £20; part-time day classes or evening classes, £3 3s.

PORTSMOUTH.—Municipal College.—Instruction in Science and technological subjects. Fees, £2 2s. to £3 8s. per term for full-time day courses; 7s. 6d. to 25s. per lesson for evening courses.

READING.—University.—B.Sc. course for university examination, £35 per session. Evening classes in chemistry and botany.

ROCHDALE.—Municipal Technical School.—Evening classes in chemistry and botany (practical work included).

ST. ANDREWS.—University College.—Inclusive fee for courses for B.Sc. degree in pure science, £94 10s.

SALFORD.—Royal Technical College.—Two years' full-time day course, for which a diploma, endorsed by the Board of Education, is awarded. Evening courses in chemistry and physics, qualifying for "course" and "higher course" certificate.

SHEFFIELD.—University.—Degree courses in science. The composition-fee for three-year B.Sc. course is £90.

SOUTHAMPTON.—University College.—B.Sc. course composition fee, £32 per session. Evening classes in science subjects £1 to £5 per course.

SWANSEA.—University College and Technical College.—Evening classes in chemistry, physics and botany. Day courses are held for degrees in science.

WIGAN.—Full-time day courses in chemistry, £10 10s. per session; also evening classes, 17s. 6d. to 22s. 6d. per session.

Optical Diplomas

Chemists desirous of undertaking sight-testing and spectacle fitting have always been advised by THE CHEMIST AND DRUGGIST to pass before practising the examinations of one of the recognised examining bodies—not because this is legally necessary at present, nor for the value of the certificate when exhibited to the public generally, but on account of the training and experience necessary for passing the examinations being the minimum knowledge with which the candidate should be trusted to deal with people's eyesight. Though the Optical Practitioners' Bill has not yet passed the second reading in Parliament, there is every prospect of that or similar legislation reaching the Statute Book in the near future. The optical examining bodies are continually revising their examinations on progressive lines, and in one case a preliminary examination approaching matriculation standard is required. After qualifying a post-graduate course at a Refraction Hospital, of which there is one in London and another in Leeds, where a more intimate knowledge of the diseases of the eye may be obtained, is strongly to be recommended. Scholarships are available at the Northampton Polytechnic Institute, London, q.v.

The Diploma Schemes

THE SPECTACLE MAKERS' COMPANY, 18 Temple House, Temple Avenue, London, E.C., holds its examination in London in May and November. Candidates must satisfy the examiners in all sections of the examination, which is divided into two parts, the Preliminary being concerned with general and practical optics, and the Final with visual optics and sight-testing. Candidates over eighteen years of age are admitted to the Preliminary division, but not to the Final until twenty-one years of age. Those over forty years of age, who have spent ten years in the optical industry, are exempted from sections (a) and (c) of the Preliminary. The fees are £4 4s. for each division, and in addition there is a registration fee of £4 4s. (including £3 Government duty), payable when the diploma is issued, and an annual payment of 4s. to the Company for "quarterage." A diplomate is entitled to use the initials F.S.M.C. and the arms of the Company for business purposes, and to claim the freedom of the City of London at a cost of £2 2s. The subjects of the examination are as follows:—

Preliminary: (a) Optical bench work, (b) and (c) general and practical optics, (d) neutralisation of lenses and lens-setting.

Final: (e) Frame adjustments and measurements, (f) and (g) visual optics, (h) practical sight-testing.

The full prospectus, with application form, can be obtained from the Clerk of the Company.

THE BRITISH OPTICAL ASSOCIATION (incorporated 1895), 10 Clifford's Inn, London, E.C.3, conducts a Preliminary, a Fellowship and an Honours examination, the first-named being in general education and the others in optics. No candidate will be accepted for the Fellowship examination who has not previously passed the Preliminary or an examination of a similar standard, e.g., Senior College of Preceptors, Pharmaceutical Society of Great Britain and of Ireland, provided the candidate has passed in mathematics, English and one scientific subject. The Fellowship examination of the Association is divided into five sections, as follows: (A) Estimation of refractive errors; (B) physiologic optics; (C) mechanical and visual optics; (D) anatomy and physiology; (E) recognition of abnormal conditions. The Honours examination is in the following subjects: (A) Advanced physiological optics; (B) ocular embryology and physiology; (C) ophthalmic instrumentation; (D) recognition of pathologic conditions of the eye; (E) ethics and etymology. A thesis may be submitted in place of the written part of this examination. The examinations are generally held in London in May and November, in Edinburgh in September, in Manchester about June, and occasionally in other centres. The annual subscription is £3 3s., except for members resident overseas, who pay £1 11s. 6d.

Educational Information

The examinations are open to persons over eighteen years of age. Successful candidates over the age of twenty-one, or on attaining the age of twenty-one, are required to take up the membership of the Association. Certificates are not supplied until the applicant has reached the age of twenty-one. Each candidate must agree to the regulations of the Association. The fees for the Association's examinations are: Preliminary, £2 12s. 6d.; Fellowship, £10 10s.; Honours, £5 5s. The full prospectus may be obtained from the Secretary.

THE NATIONAL ASSOCIATION OF OPTICIANS, 130 Princes Road, Liverpool, has instituted a diploma scheme for which the examinations are held in January and July at such places as the Council may determine. On qualifying the candidate is granted the Fellowship diploma and is entitled to use the initials F.N.A.O. The examination consists of two parts, the First and the Final, which may be taken separately. The former is open to candidates under the age of twenty-one, but no certificate is issued until they are fully qualified. Candidates aged forty years and over are allowed to enter for the Final examination on the payment of an entrance fee of £5 5s. The subjects are as follows:—

First: (a) A written examination in general and practical optics, and optical calculations. (b) Oral examination in general and practical optics, and optical calculations. Fee, £3 3s.

Final: (a) Written examination in visual optics, in anatomy, physiology and diseases of the eye. (b) *Viva-voce* examination in visual optics, in anatomy, physiology, and diseases of the eye. (c) Practical sight-testing. (d) Practical face and frame measurements. (e) Practical analysis and marking of lenses and prisms. Fee, £3 3s.

The prospectus may be obtained from the Secretary.

THE COLLEGE OF OPTICS holds a Fellowship examination in Glasgow twice yearly, and occasionally at other centres. The examination is divided into three parts, Preliminary, Intermediate and Final. Candidates over twenty-one years of age and holding certain certificates, such as that of the Pharmaceutical Society or an approved optical diploma, or having at least five years' sight-testing experience, are excused the Preliminary. On passing the examination there is an election fee of 10s. 6d., and an annual subscription of 10s. 6d. to be paid. Diplomates are allowed to use the letters F.C.O. The subjects of the examination are as follows:—

Preliminary: Dynamics, hydrostatics, heat, sound, light, lenses. Fee £1 1s.

Intermediate: Written, practical, and oral examinations in ophthalmic optics. Fee, £2 2s.

Final: Visual and physiologic optics and subjective and objective sight-testing. Fee, £2 2s.

The prospectus may be obtained from the secretary, 991 Shettleston Road, Glasgow, E.

Optical Instruction

The following are among the principal schools where the necessary instruction in preparation for the examinations of the bodies named may be obtained:—

NORTHAMPTON POLYTECHNIC INSTITUTE, St. John Street, London, E.C.1.—In the applied optics section training is given for ophthalmic and dispensing opticians. The department is provided with well-equipped laboratories for anatomy, physiology, sight-testing, general optics and optical instruments, together with workshops for lens grinding edging, etc., instrument making and spectacle frame work. The work required for the F.S.M.C. and F.B.O.A. examinations is covered in both day courses (full-time) and evening courses. The fees range from 30s. per session for evening courses to £18 for the full-time day course. Scholarships tenable at the full-time day course are offered by the governing body and by the Aitchison Memorial Committee. The examination for the latter will be held on September 28 and 29. Evening classes commence on September 26, and day classes on October 4. Enrolments for evening classes are taken during the week commencing September 19. The head of the applied optics department is Mr. H. H. Emsley, B.Sc. For prospectus and full particulars, apply to Mr. S. C. Laws, M.A., M.Sc., Principal.

THE SCHOOL OF OPTICS, LTD., 2 Guilford Place, London, W.C.1, where Mr. Lionel Laurance, who is official instructor to the Spectacle Makers' Company, and Mr. H. Oscar Wood prepare students for the Company's examination, is well fitted up and thorough training is given. The complete full-time course (fee £31 10s.), which commences in May and November of each year, terminates with the next succeeding examination, and covers both the Preliminary and Final divisions. The part-time combined course (fee £14 14s.), which can be commenced at any time, consists of homework by correspondence, supplemented by classes held during the four weeks preceding the examination.

THE BRITISH OPTICAL INSTITUTE, LTD., Fern Lodge, 20A Grove Road, London, S.W.9 (Principal, Dr. Max Coque, B.Sc.).—The full and part-time courses cover the entire syllabus of each optical examination. Afternoon classes are held all the year round on two days a week in order to enable students to carry out all branches of practical work. Evening classes are held during the three months preceding each examination. A special feature of the Institute is the clinic. Two well-fitted rooms are devoted to subjective and objective work respectively. The fees range from £8 8s. to £16 16s., according to the course. For full particulars apply to the Principal.

MR. C. A. SCURR, F.S.M.C., F.B.O.A., chemist and druggist, 50 High Street, Barnet, prepares candidates for either of the foregoing examinations. The courses, being mainly correspondence, are particularly suitable for those desiring an optical qualification by spare-time study. The practical work is arranged to suit the students' convenience, but is usually performed during a visit to London just prior to the examination. This also gives an opportunity for revision or additional personal coaching. The tuition fee for either examination is £8 8s., that for the F.N.A.O. Final examination only being £5 5s.

MUNICIPAL COLLEGE OF TECHNOLOGY, Manchester, conducts evening classes in applied optics which cover the syllabus of the British Optical Association's examinations. Special facilities are provided for post-fellowship research in applied optics during the part-time session of the College. Full particulars may be obtained from the Registrar.

CENTRAL COLLEGE OF OPTICS, 89 Empress Avenue, Ilford, conducts courses of instruction for the preliminary and qualifying examinations of all the examining bodies. Instruction is carried out by correspondence, supplemented by practical work prior to the examination. Students may commence at any time. Full particulars may be obtained from the Registrar.

THE BATH AND WEST OF ENGLAND COLLEGE OF PHARMACY, Cleveland Place, Bath, conducts classes for candidates preparing for the B.O.A. and S.M.C. examinations. The courses commence during the first week of May and November, and extend over a period of six months. Full particulars may be obtained from the Principal.

THE COLLEGE OF OPTICS, 395 Argyle Street, Glasgow, holds all-day, part-time and postal courses, which cover the work in general and visual optics and practical sight-testing, suitable for either of the examinations. Classes are also held weekly in Edinburgh and Dundee, and occasionally in Manchester, Belfast and Dublin. The Principal is Mr. T. S. Baird, Argyle Street, Glasgow.

THE TECHNICAL COLLEGE, Bradford, conducts evening classes to meet the requirements of the Spectacle Makers' Company and the three examinations of the British Optical Association. Particulars may be obtained from the Principal, Mr. H. Richardson.

REFRACTION HOSPITALS.—The lectures and demonstrations arranged in connection with the granting of the hospital certificate commence in September. The subjects include general physiology, ocular histology, embryology, methods of examination, use of drugs, ocular diseases (internal and external), and hospital routine. Post-graduate students in ophthalmic optics may attend the hospital without taking the examination. Full particulars can be obtained on application to the Secretary, 58 Newington Causeway, London, S.E.1, or 51 St. Paul's Street, Leeds.

Educational Information

Veterinary Surgery

Licences in veterinary surgery are granted in this country by the Royal College of Veterinary Surgeons, 10 Red Lion Square, London, W.C.1, which body confines itself to examining candidates for its diplomas of membership (M.R.C.V.S.) and fellowship (F.R.C.V.S.), the former qualifying the holder to be placed on the Register and to practise. Educational facilities are provided at the affiliated colleges in London, Edinburgh, Dublin, Glasgow and Liverpool. Candidates who desire to enter upon a course of study for qualification must first pass a recognised examination in general education, and submit to the Royal College the certificate so gained for the approval of the Council. Among the preliminary examinations recognised by the College, provided the subjects include English, mathematics, a modern foreign language, and an optional subject, are, until August 31, 1928, the Junior Certificate of the College of Preceptors, Bloomsbury Square, London, W.C.1, and the Preliminary in General Education of the Educational Institute of Scotland, 47 Moray Place, Edinburgh. The latter body also conducts a special veterinary preliminary examination, in February, June, August and November, in London, Edinburgh, Glasgow, Liverpool and Dublin. The fee is £1 1s. The professional course of training covers a period of four years. At the end of each year it is necessary to pass an examination, the subjects of which are as follows:—

First Professional Examination.—Chemistry and physics; biology; elementary zoology and botany.

Second Professional Examination.—Anatomy of the domesticated animals; histology and physiology; animal management, and the principles of shoeing.

Third Professional Examination.—Pathology, bacteriology, and morbid anatomy; materia medica, pharmacy, therapeutics, and toxicology; veterinary hygiene and dietetics.

Fourth Professional Examination.—Principles and practice of veterinary medicine; meat inspection; principles and practice of veterinary surgery and obstetrics.

Graduates in arts, science, medicine, or agriculture, and holders of the diploma of M.R.C.S., or L.R.C.P., may be exempted from the first year's course and the examination at the end of that year. The examination fee payable to the Royal College of Veterinary Surgeons is £5 for each examination, or £3 3s. for re-examination in the same class. In the case of graduates exempted from the first year's course, the examination fee for the following year is £8, and the re-examination fee in case of rejection is £4 4s. In addition to the post-graduate, several entrance scholarships are open at the affiliated colleges. The Royal College also grants a diploma in Veterinary State Medicine (D.V.S.M.). This is only open to members.

Veterinary Colleges

(Affiliated to the R.C.V.S.)

LONDON.—*Royal Veterinary College* (founded 1791; incorporated 1875), Great College Street, Camden Town, N.W.1.—Educational fee for four years' course of instruction, £105, may be paid in four instalments. There are also library and other fees amounting to £5 12s. 6d. Fees for occasional students are from £3 3s. to £8 8s. per subject, and for those taking the B.Sc. degree in veterinary science of the University of London additional fees totalling £15 15s. Secretary, Mr. T. C. Wright.

EDINBURGH.—*Royal (Dick) Veterinary College*, Summerhall (founded 1823).—Class-fees for the complete curriculum amount to £105, with an extra fee of £12 12s. for each subsequent period of ten weeks. There is also a matriculation fee of 10s. 6d. payable by all students at the beginning of each session. Principal, O. Charnock Bradley, M.D., D.Sc., M.R.C.V.S.

DUBLIN.—*Veterinary College of Ireland*, Shelbourne Road, Ballsbridge.—The College is conducted by the Department of Lands and Agriculture. The tuition fees for the full course amount to £84. Principal, Professor J. F. Craig, M.A., M.R.C.V.S. Particulars may be obtained from the Registrar.

GLASGOW.—*Glasgow Veterinary College* (established 1862; incorporated 1909), Buccleuch Street, Garnethill. Full particulars are obtainable from the secretary. Principal, H. W. Whitehouse, M.A., M.R.C.V.S.

LIVERPOOL.—*The University Veterinary School* gives a university training for the M.R.C.V.S., and also for a veterinary degree. For the fees and complete curriculum application should be made to the Director.

Veterinary Degrees

Every candidate who has successfully negotiated the four professional examinations is required to pay a further fee of £1 for registration. Having obtained his diploma, the graduate is eligible for numerous official appointments at home and abroad and commissions in the veterinary units of the Army. A member of the Royal College who has been engaged in the practice of his profession for two years or upwards may present himself for examination for the diploma of Fellowship (F.R.C.V.S.). Veterinary science degrees are granted by the Universities of Bristol, Edinburgh, Glasgow, Liverpool, London and Manchester to candidates who matriculate and take the prescribed course of study. These degrees, however, do not in themselves enable the graduate to practise as a veterinary surgeon.

Books for Students

Each college principal has a preference for certain textbooks which students are required to use. Some even have their own series specially printed. The following list contains some of the popular text-books for pharmaceutical students, and others will be found in the *C. & D. Diary*, 1927.

BOTANY

- "Pharmaceutical Botany" (*C. & D. Office*), 5s.
- "Elementary Botany," Edmonds (Longmans), 4s.
- "Botanists' Pocket Book," Hayward, revised by G. C. Bruce (Bell), 5s.
- "Practical Botany for Beginners," Bower and Gwynne-Vaughan (Macmillan), 4s.
- "Text-book of Botany for Medical and Pharmaceutical Students," James Small (Churchill), 21s.
- "Botany for Students of Medicine and Pharmacy," Fritch and Salisbury (Bell), 10s. 6d.

CHEMISTRY

- "Elementary Inorganic Chemistry," James Walker (Bell), 5s. (suitable for beginners).
- "Text-book of Inorganic Chemistry," Senter (Methuen), 7s. 6d.
- "Modern Inorganic Chemistry," Mellor (Longmans), 12s. 6d.
- "Text-book of Inorganic Chemistry," Newth (Longmans), 8s.
- "Text-book of Inorganic Chemistry," Partington (Macmillan), 15s.
- "Theoretical Organic Chemistry," Cohen (Macmillan), 7s.
- "Inorganic Chemistry," Lowry (Macmillan), 20s.
- "Volumetric Analysis," Hampshire (Churchill), 7s. 6d.

PHARMACEUTICAL LATIN AND PRESCRIPTION-READING

- "Latin Grammar of Pharmacy," Joseph Ince (Baillière), 7s. 6d.
- "Medical and Pharmaceutical Latin for Students of Medicine and Pharmacy," R. R. Bennett (Churchill), 10s. 6d.

MATERIA MEDICA

- "Materia Medica," Southall, revised by E. W. Mann (Churchill), 12s. 6d.
- "Text-book of Materia Medica," Greenish (Churchill), 25s.

PHARMACY

- "British Pharmacopœia," Constable, 10s. 6d.
- "British Pharmaceutical Codex" (Pharmaceutical Society), 30s.
- "Practical Pharmacy," Lucas (Churchill), 27s.
- "Essentials of Pharmacy," Wootton (London College), 5s.
- "Art of Dispensing," MacEwan (*C. & D. Office*), 8s.

PHYSICS

- "Practical Physics," Allen and Moor (Macmillan), 10s. 6d.
- "Text Book of Physics," Duncan and Starling (Macmillan), 18s.
- "Manual of Physics," Crowther (Oxford University Press), 14s.

Trade Report

The prices given in this section are those obtained by importers or manufacturers for bulk quantities or original packages. To these prices various charges have to be added, whereby values are in many instances greatly augmented before wholesale dealers receive the goods into stock, after which much expense may be incurred in garbling, packing, etc. Qualities of chemicals, drugs, essential and fixed oils, and many other commodities vary greatly, and higher prices than those here quoted are charged for selected qualities of natural products even in bulk quantities.

42 Cannon Street, E.C.4, August 11.

RETAIL buying is generally in evidence this week in the Mincing Lane produce markets. Senega maintains its strong position, and divergent opinions are held regarding new crop. French chamomiles new crop are ready for delivery, and first pickings are of good quality. Japanese camphor is selling freely on the spot at the recent lower prices. Metallic products—antimony, bismuth, magnesium, mercury and platinum—are slow but fairly steady; cadmium, however, has been in good demand. Little interest is shown in new crop cascara, which is as last quoted. Cloves are quiet and easier, Lobelia new crop is again cheaper. Peppers have been active and are dearer. Shellac is firmer but irregular. New crop senna is arriving, but so far the quality seems poor. New crop Maltese cumin seed is dearer, but Morocco cumin is cheaper. Coriander is firmer. Among the essential oils, Japanese peppermint has been in speculative demand and is dearer. American peppermint is firm, and some holders have withdrawn. Lemon oil is dearer. Star anise and cassia are cheaper; Japanese camphor is lower, and American cedarwood has declined. Lemongrass is cheaper. There is keen competition for business among the pharmaceutical chemicals, but price changes are unimportant. Cheaper quotations are reported for bromides in some directions, but the general level is unaltered. Citric and tartaric acids are expected to decline. Hydroquinone is in good seasonable demand at steady rates. Sodium salicylate is on the easy side. In industrial chemicals a fair demand has been noted in several products. Arsenic is tending firmer, and oxalic acid is steadier. A sharp decline took place in ammonium sulphate, and lead products are cheaper. Cheaper prices are quoted for toluol and xylol. Lead products have been fairly active, but are easier on the week. Rubber has improved.

Higher	Firmer	Easier	Lower
Arsenic	Coriander seed	Antimony	Ammonium sulphate
Cumin seed, new crop (Maltese)	Menthol	(Chinese)	Anise (star) oil
Lemon oil	Peppermint oil (Jp.)	Barbitone	Camphor oil
Maize starch (Amer.)	Shellac	Bromides	Cassia oil
		Canary seed (c.i.f.)	Cedarwood oil
Peppers		Cloves	Cocoa butter
Pitch		Lead products	Lemongrass oil (Cochin)
Rubber	Steadier	Pimento	Lobelia
Toluol		Pyridine	
Xylol		Sodium salicylate	
	Oxalic acid		
	Platinum		

Crude Drugs, etc.

ANTIMONY.—The tone is again dull, and spot parcels of Chinese are obtainable at about £52, ex warehouse, while terms for forward shipment are at around £46 10s. English high-grade refined is £69 10s. to £70. According to a report from Canada the leading smelting concern there is making arrangements to handle antimony as a by-product at their Trail smelter; but so far returns of production are not available. Chinese crude metal is nominally £36 to £38. August-September shipment is cheaper at £34 c.i.f.

BISMUTH has been very steady for some time at 8s. per lb. for not less than 5 cwt. lots. It was reported that the recovery of bismuth from cobalt ores in Ontario amounted, last year, to about 4,600 lb.

CADMIUM is in good demand, with Australian metal at 1s. 10d. per lb.; other supplies are nominal at 1s. 11d. per lb.

CAMPHOR.—Japanese slabs are quoted on the spot for five-case lots at 2s. 4½d. per lb. Single cases, 2s. 6d. For forward shipment five-case lots are offered at 2s. 3d. c.i.f., and about 2s. 0½d. c.i.f. for 25- and 50-case lots; ¼ oz. tablets on the spot are scarce, and 3s. has been paid. To arrive in a month, 2s. 10½d. c.i.f. is quoted.

CASCARA SAGRADA.—Very little interest is shown, although spot values favour buyers. Old bark can still be had between 65s. and 67s. 6d., whilst for new crop 57s. 6d. to 58s. c.i.f. is mentioned, which is on the easy side.

CHAMOMILES.—French new crop is ready for delivery next week; first pickings, good colour and size, are offered at 110s. per cwt.; second pickings, 105s.

CINCHONA.—An auction of 1,007 packages Java pharmaceutical bark, weighing 46,905 kilos, will be held at Amsterdam on August 24.

CLOVES are quiet and easier, with Zanzibar offering at 7½d. to 8d. per lb. on the spot. To arrive, October-December shipment is quoted at 7½d. per lb. c.i.f., delivered weight. The landings in London during the week ended August 6 were 100, and the deliveries 37, leaving a stock of 12,188 bales, against 12,437 in 1926, and 11,432 bales in 1925. Up to August 6 the landings of Zanzibar in London have been 15,058, against 9,759 in 1926, while the deliveries amount to 10,473, against 11,592.

COCOA BUTTER.—Prime English CFR is unchanged at 1s. 9d. per lb.; other makes are cheaper at 1s. 8½d. in not less than one-ton lots.

CORN PRODUCTS, ETC.—Guaranteed water-white glucose (corn syrup) is quoted at 21s. per cwt. for prompt and August delivery, ex store, London, duty paid. Dutch maize starch powder (cornflour) is 14s. 6d. per cwt. on the spot. American, for August delivery, is dearer at 14s. 9d. per cwt. net, ex store, London. Pearl starch is 14s. 3d. per cwt. for August delivery, ex store, London. Dutch maize starch crystals is 19s. 6d. on the spot, and American for August delivery is 19s. per cwt., ex store, London. Dutch dextrin is 22s. per cwt. for superior. American canary for August delivery is 18s. 3d. White, 18s. per cwt., ex store, London, for August. Dutch farina is 17s. 6d. per cwt. on the spot, and 16s. 6d. per cwt. f.o.b. for prompt shipment.

HYDRASTIS is offered on the spot at 19s. 6d. per lb. There is a steady demand, recent arrivals being promptly cleared.

IPECACUANHA is marking time; Minas is quoted at 16s. 6d. to 17s. per lb.; Matto Grosso 18s. Carthagena is neglected at 13s. 6d. to 14s.

LIQUORICE.—Common natural root is still scarce; fairly clean root is offered at 21s. per cwt. spot, and prompt shipment from Hamburg, in quantity, is quoted 18s. 6d. c.i.f.

LOBELIA new crop is lower to arrive at from 11d. to 1s. per lb., c.i.f. On the spot 3s. 6d. to 3s. 9d. is quoted.

MAGNESIUM is steady with demand moderate; small ingots or sticks sell at 3s. 9d. to 4s. 3d. per lb. Terms for powder range from 5s. to 6s. 3d. per lb., according to quality and quantity.

MENTHOL is a shade firmer, with Kobayashi-Suzuki quoted at 16s. 1½d. to 16s. 3d. per lb. October-December shipment is 15s. c.i.f., and January-March 14s. 6d. to 14s. 9d. c.i.f.

MERCURY.—The undertone is firm, but business has remained quiet. There is apparently little secondhand offering, and the principal sellers are holding off. The American price is still reported at about \$123, duty paid, but business there is restricted. American imports this year to the end of July were reported at roughly 15,000 bottles, which requires confirmation. Reports concerning the tenders alleged to have been invited by the Almaden Mines for their next yearly production are still contradictory, and it is even asserted in one quarter that there has been no official intimation to that effect. Current quotations for fair-sized lots on the spot remain on the basis of £21 15s. to £22 per bottle.

MUSK.—Shipments from China have arrived in London during the week valued at £968, and from French Indo-China valued at £500.

OLIBANUM.—Good bold clean drop is scarce, with practically nothing in first hands; second hands quote 107s. 6d. to 112s. 6d. per cwt.

OPUM.—The following report has been received from Turkey:—

CONSTANTINOPLE, July 30.—During the past fortnight arrivals consisted of 587 cases druggists', 32 cases "softs," and 52 cases Malatia. The stocks amounted to: druggists', 831 cases; "softs," 91 cases; Malatia, 114 cases. The corresponding stocks last year were 597, 24 and 200 respectively. Sales included 79 cases druggists' at £T30 to £T35, one case "softs" at £T33, and 29 cases Malatia at £T32. Altogether 61 cases have been bought speculatively at £T33 to £T35. We cannot say exactly what is the position of the market. Speculators are very active and are picking up all the lots as they are offered. Some claim that these are orders from the interior; others on the spot look for better prospects and are not quoting below £T40 to £T45. It has been found that the qualities are not so good this year, and this will probably result in higher prices in sterling.

PEPPER.—The market opened easier, but again advanced. Fair black Singapore is dearer at 1s. 5d. per lb. spot; August-October shipment has been sold at 1s. 3d. to 1s. 3½d. c.i.f. Lampong is 1s. 5d. to 1s. 6d. for spot; Tellicherry 1s. 5½d., and Alleppy 1s. 5d. Lampong for August-October shipment has been sold at 1s. 4½d. to 1s. 4d. c.i.f. White Muntok is 2s. 2d. to 2s. 3d. spot; August-October shipment has been sold at 2s. 1½d.; October-December at 2s. 1½d. c.i.f.

PIMENTO is cheaper on the spot at 9d. per lb. Forward quotations are cheaper at 68s. per cwt. c.i.f. August-September, and 66s. c.i.f. August-October.

PLATINUM is steadier, with quotations ranging from £13 17s. 6d. to £14 per ounce for small lots, but it is reported that good parcels are obtainable at below £13 15s. per oz.

RUBBER has appreciated ¼d. per lb. on the week. A fairly active demand took place at the close on the report that the Government contemplated a reduction in the assessments granted to the producers from 400 lb. to 300 lb. per acre. Confirmation, however, is awaited. Some speculation is taking place, chiefly in forward positions, and the premium on the distant positions, such as January-March delivery, is widening, and is at present 1¼d. per lb. over spot. Deliveries last week were small, amounting to only 978 tons, and arrivals totalled 1,529 tons, showing a further increase of 551 tons in stocks. The small deliveries were mainly due to withholding 700 to 800 tons intended for Russia. London stock now stands at 64,177 tons, against 27,972 tons at the corresponding period last year. Quotations (Wednesday, 5 p.m.): No. 1 standard ribbed smoked sheet, spot and August, 1s. 5½d.; September, 1s. 5½d.; October-December, 1s. 5½d.; January-March, 1s. 6½d.

SEEDS.—There are few changes of importance to record and business still remains quiet. ANISE.—Spanish is 49s. and Russian 28s. CANARY.—Mazagan, 16s. 6d. is asked for spot and 15s. 3d. c.i.f. for forward shipment; Saffi is 16s. to 16s. 3d. spot. CUMIN.—Maltese is 55s. spot, and 55s. c.i.f. is now quoted forward; Morocco is 47s. 6d. spot and 45s. c.i.f. for forward. CORIANDER.—Morocco is again firmer: 36s. 6d. c.i.f. is quoted for forward shipment and 40s. for spot. FENUGREEK remains at 14s. 6d. spot, and 13s. c.i.f. is quoted for shipment. HEMP.—Manchurian is 14s. to 15s. LINSEED.—Mazagan is 19s. spot and 17s. 9d. c.i.f. for shipment. MUSTARD.—English is 29s.

SENEGA.—A bale here and there in second hands is offered below market rates, but first hands are tending firm, spot being held for 4s. 9d. per lb., and the new crop at a slightly higher figure.

SENNA.—Several shipments of new crop Tinnevely have arrived, and the earlier reports that the crop had been severely damaged appear to be correct. Parcels of both leaves and pods on examination have been found to be discoloured, especially the finer grades, Nos. 1 and 2. Good No. 1 is very scarce, and from 7d. to 7½d. per lb. is asked.

SHELLAC.—The market is firmer on the week but irregular, usual standard TN orange being quoted at 240s. per cwt.; fine orange is 270s. to 330s., pure button 300s. to 305s., AC oakey 220s. to 230s. To arrive, TN September-October sold 231s., 233s., 230s.; October-November sold 233s., 232s., and 230s. c.i.f. For delivery TN August sellers at 235s. Sales include October 239s., 242s., 239s., 240s., December 240s., 243s. 6d., 240s., 242s. 6d., 239s. and sellers.

SULPHUR.—There is a fair demand for crude at £6 5s. to £6 7s. 6d. c.i.f., while terms for refined stand at £17 7s. 6d. for flowers, and £10 15s. for roll, all c.i.f.

Essential Oils

HIGHER quotations have been made this week for lemon oil at the source. Star anise and cassia have declined, with sales of the latter at the new level of quotations. Japanese peppermint has revived, particularly in the forward positions. Some holders of American have temporarily withdrawn from the market. Eucalyptus has been selling freely. Cochin lemongrass is weaker.

ANISE (STAR).—"Red Ship" is cheaper to arrive at 2s. 4½d. per lb. c.i.f. in leads and 2s. 3½d. c.i.f. in tins. Spot is also easy at from 2s. 6d. to 2s. 7d.

CAMPHOR.—Japanese white essential is cheaper on the spot at 62s. 6d. per cwt. in large drums. For repacked, 70s. is quoted.

CASSIA.—Fair business for distant shipment has been done between 5s. 10d. and 6s. per lb. c.i.f., which is cheaper, but higher quotations are still current. Spot remains nominal at 7s.

CEDARWOOD.—American is cheaper on the spot at from 1s. 3d. to 1s. 4d. per lb. in large drums, and cases at 1s. 4½d. to 1s. 5d.

CINNAMON.—Ceylon leaf is unchanged at 6s. 4d. per lb. on the spot. For shipment 5s. c.i.f. is quoted in large drums.

CITRONELLA.—Ceylon on the spot is unchanged at 1s. 4½d. per lb., and for shipment 1s. 3d. c.i.f. Java oil is 1s. 8½d. spot and 1s. 7½d. c.i.f.

EUCALYPTUS.—Fair arrivals of Australian have eased the spot price very slightly, and 70 to 75 per cent. is being offered at 1s. 1½d. to 2s. per lb. Shipments are still below normal, but Spanish oil appears to be now a steady competitor. *E. citriodora* sells in small lots at from 7s. 3d. to 7s. 6d.

GINGERGRASS in original pots is offered at 7s. 3d. per lb. for spot and 7s. c.i.f. to arrive.

LEMON is dearer to arrive for some brands at from 7s. 6d. to 7s. 10½d. per lb. c.i.f. Spot demand is slow and prices irregular; usual brands are quoted at 7s. 3d. to 7s. 6d., but sales are being made at around 7s. in some directions. Californian distilled is in steady demand at 5s. 9d. to 6s.

LEMONGRASS.—Cochin is cheaper at 3s. 5d. to 3s. 5½d. per lb. in large drums on the spot, and 3s. 4½d. to 3s. 4½d. c.i.f. to arrive.

PALMAROSA on the spot is quoted at 9s. 6d. per lb., and for shipment 9s. 3d. c.i.f.

PEPPERMINT.—Some holders of American natural tin oil have withdrawn for the present, following instructions from U.S. It is stated that severe frosts have interfered with the crop. Recently business has been passing in September-October shipment at about 12s. 9d. per lb. c.i.f. Spot is nominal at 17s. For prompt shipment, 15s. to 15s. 3d. c.i.f. is still quoted in some directions. Japanese demethylised is rather dearer. Sales include October-December at 6s. 10½d. c.i.f. and buyers, sellers 7s. 3d.; and January-March (1928), buyers 6s. 10½d., sellers 7s. 1½d. On the spot, sales of Kobayashi-Suzuki have been reported at 7s. 6d., and some holders now ask up to 7s. 9d.

SPIKE.—A start has been made on the new Spanish oil, and it is expected that a much smaller crop will be made in view of the recent period of low prices. Present spot value of fair quality is about 3s. 7d. to 3s. 9d., in large drums.

WORMSEED (CHENOPODIUM).—American is unchanged at 16s. 6d. per lb. c.i.f. Spot is scarce at 17s.

The following arrivals have taken place from the countries indicated during the period August 4 to 10 (inclusive):—Bergamot (It.), 26 cs.; camphor (Ger.), 10 dm.; cassia (Ch.), 5 cs.; cinnamon (Seych.) 13 dm.; citronella (Jv.), 17 dm.; geranium (Réun.) 1 dm., 20 cs., (Alg.) 3 dm.; lavender (Fr.), 2 cs.; lemon (It.), 62 cs., 20 x ½ cs.; lime (Can.), 3 cs.; mandarin (It.), 1 cs.; orange (B.W.I.) 4 cs., (It.) 6 cs.; peppermint (U.S.) 16 cs.; pimento (B.W.I.), 2 dm.; pine (Ger.), 1 dm.; rosemary (Sp.), 2 dm.; rosewood (Fr.), 2 cs.; various (Holl.) 3 cs., (U.S.) 43 cs., (It.) 6 cs.

Pharmaceutical Chemicals, etc.

FINE chemicals are practically unchanged. Citric and tartaric acids are nominally unaltered, but lower prices may be expected.

ASPIRIN is comparatively quiet, but prices are steady at from 2s. 4d. to 2s. 5d. per lb., as to grade and quantity.

BARBITONE remains dull, and the price of about 5s. 9d. per lb. might be shaded.

BENZOIC ACID (B.P.) has been rather quieter, but prices for British made are steady at about 2s. 1d. per lb., ex works, for quantities. Continental, p.f.f.c., 3s. per lb., spot.

BROMIDES.—This market has been rather quiet, and in some quarters offers at cheap rates are reported: British: ammonium about 2s. 3d., potassium from 1s. 10d., sodium, B.P., from 2s. 1d. per lb. Imported material is quoted at keen rates: ammonium 2s. 1d., potassium, B.P. crystals, 1s. 9d., granular 1s. 8½d., sodium, B.P., 1s. 10½d. to 1s. 11d. per lb.

CALCIUM LACTATE meets with occasional business, with prices round about 1s. 2d. per lb.; market remains steady.

CHLORAL HYDRATE (duty-paid crystals) continues steady at the recent advances of about 3s. 2d. to 3s. 3d. per lb., and perhaps a shade less for large quantities.

CITRIC ACID (B.P. crystals).—The buying season, which is closing, has been disappointing, due, no doubt, to the poor summer this year. Secondhand parcels continue to be offered at about 1s. 7½d. to 1s. 8d. per lb., less 5 per cent., and forward from 1s. 8½d., less the discount. The market is holding at these figures at the moment, but weaker conditions may be expected.

CREOSOTE B.P. continues to be offered at about 1s. 8½d. to 1s. 9d. per lb., for quantities in demijohns; market quiet.

CREOSOTE CARBONATE remains dull; current quotations are at 5s. 9d. to 6s. per lb., spot.

GUAIACOL CARBONATE.—Prices for small parcels are around 5s. per lb.

HEXAMINE.—Quotations range from 2s. 3d. to 2s. 4½d. per lb., according to quantity.

HYDROQUINONE is in seasonable demand, and quoted at 2s. 1½d. to 3s. per lb.

LACTIC ACID (B.P.) is quoted from 2s. 6d. per lb.; pale technical, 50 per cent. by weight, is £43 per ton, spot.

METHYL SALICYLATE remains dull at about 1s. 6d. to 1s. 6½d. per lb.

METHYL SULPHONAL is obtainable at about 9s. 6d. per lb., but 9s. 9d. to 10s. is more general.

MILK SUGAR.—There has been no further alteration, and importers quote from 57s. to 58s. per cwt., in cases, for German.

PARAFORMALDEHYDE (100 per cent. powder).—Some inquiry has been made recently: prices are in the region of 1s. 8d. to 1s. 8½d. per lb.

PHENACETIN.—The volume of business remains small, while offers are too numerous and very competitive: prices are about 2s. 8d. per lb. for cwt. lots.

PHENAZONE is fairly steady at about 4s. 3d. to 4s. 4d. per lb., these prices leaving very little margin for importers.

POTASSIUM PERMANGANATE (B.P.) remains quiet, with dealers' prices controlled at 6½d. per lb., in drums.

RESORCIN has met with a little more business: dealers' prices are unchanged at 3s. 10d. to 4s. per lb. as to quantity.

SALICYLIC ACID.—The demand in this market has remained slow: quoted prices are from 1s. 3d. per lb. Slightly less might be accepted for big business.

SALOL is unchanged as quoted on the spot at 2s. 3½d. to 2s. 3¾d. per lb., and 1½d. per lb. more for powder; market is quiet.

SODIUM BENZOATE (B.P.).—Demand has slackened off, and offers are unsteady at 1s. 7½d. for quantities in two-cwt. barrels.

SODIUM DIETHYLBARBITURATE is easy at 8s. per lb.

SODIUM SALICYLATE (B.P.) is unchanged, but the market is still comparatively quiet, and prices might be shaded: crystals, 1s. 9½d.; powder, from 1s. 9d. per lb.

TARTARIC ACID (B.P. crystals).—Our comments on citric acid also refer to this product: spot offers of secondhand parcels remain at 1s. 3½d. to 1s. 4d. per lb., less 5 per cent., with nothing much moving.

TERPIN HYDRATE is offering at 1s. 6d. to 1s. 8d. per lb.

THYMOL (B.P. fine white).—The position is as recently reported: competition has brought prices down to 10s. 3d. to 10s. 6d. per lb., with the market quiet. Ex ajowan seed is 11s. 3d.

VANILLIN (100 per cent. from cloves) is offered at about 17s. per lb., and less for any big business; demand has been distinctly quiet for some weeks.

Among the chemicals which have paid Key Industry duty during the period July 27 to August 10 are the following:—Acetyl-salicylic acid, £128; carbon tetrachloride, £276; cocaine hydrochloride, £207; lithium hydroxide, £159; medicinal tablets, £147; metaldehyde, £487; potas. bromide, £145; undensated chemicals, £1,520.

Industrial Chemicals, etc.

London, August 10.

PRICES for sulphate of ammonia show a substantial reduction. Cornish arsenic has again advanced a point, with the market steady. Oxalic acid is steadier. ACETONE shows no change, with B.G.S., in drums, quoted from £58 to £61 per ton, ex store; business has been slow of late, but the market is steady. ACETIC ACID is steady: 80 per cent. technical and 80 per cent. pure, £37 per ton, in barrels; glacial, pharmaceutical, 99 to 100 per cent., £66, in glass demijohns; glacial, in barrels, £56 per ton, ex store. AMMONIA (ANHYDROUS) is moving in small parcels: 99.95 per cent. being at 1s. per lb., in loaned drums, carriage paid; co-tracks at cheaper rates. AMMONIUM CHLORIDE.—Spot grey galvanising is £22 per ton, in casks, ex store; cheaper prices for contracts. AMMONIUM SULPHATE.—Reductions in prices have been notified as follow: for home trade, spot, £9 18s.; September, £10; October, £10 2s.; November, £10 5s.; December, £10 8s.; January, £10 11s.; February–May, £10 13s. per ton, carriage paid, in minimum six-ton lots; export prices reduced to £9 13s. 6d. per ton f.o.b., in double bags and 10s. a ton less for single bags. ARSENIC.—The healthier appearance of the market seems maintained, while demand has been coming forward for white Cornish, prices ranging from about £16 10s. upward, f.o.r. mines, with a steady business. Outside competition is restricted, with Mexican high-grade quoted upward of £17 c.i.f. Liverpool. The tendency of the market in America is firmer and quotations stand at the higher level of 3½ to 4 cents per lb. BARIUM CHLORIDE remains quiet, with spot parcels of 98 to 100 per cent. prime white crystals at about £8 12s. 6d. per ton, in casks, ex store; cheaper for quantities to come forward. COPPER SULPHATE.—There is a fair export demand and the market rules firm. F.o.b. quotations for casks for export range from about £24 15s. to £25 10s. CREAM OF TARTAR.—Prices are steadily maintained at 97s. 6d. to 99s. per cwt., less 2½ per cent., for 99 to 100 per cent. Opinions favour an end-of-season weakening. FORMALDEHYDE is steady at about £39 per ton for 40 per cent. by volume, ex store. FORMIC ACID has been quiet in the North: prices for 85 per cent., in carboys, hold at about £45 15s. per ton, ex store. GLAUBER'S SALT, commercial quality, is offered on spot at about £3 12s. 6d. per ton, in single bags, ex store; cheaper prices for quantities to come forward. LEAD PRODUCTS.—There has been a limited demand for lead acetate, with brown at £41 and white at £43 per ton, in casks, ex store; red lead, imported, £29, c.i.f. London; white lead, dry,

£29 8s. 6d.; ground in oil, £30 18s. 6d., c.i.f. London. They are easier on the week, but there is a good inquiry on the market, which closes steady. OXALIC ACID is steadier, with more inquiry: quantities from 2½d. to 3d. per lb.; small parcels from 3½d. per lb., ex store. POTASH CAUSTIC.—Convention rates are unchanged: spot, 88 to 92 per cent. solid, £30 10s.; forward, 15 tons or more, £28 15s. per ton, c.i.f. U.K. port, in drums. POTASSIUM CARBONATE is steady at last week's reduced rates; dealers doing moderate business: 99 to 92 per cent., £25; 96 to 98 per cent., £27 per ton, in casks. POTASSIUM CHLORATE remains quiet, with spot lots at about 3d. per lb.; forward, 2½d. to 2½d. per lb. for large quantities. POTASSIUM PERMANGANATE is steady at 5½d. per lb. for commercial quality, in two-cwt. drums, ex store. POTASSIUM PRUSSIAN is steadier after the recent decline at 6½d. per lb. for quantities of yellow, in casks, ex store. SAL AMMONIAC.—A fair volume of business is passing: dog-tooth crystals, £29; medium, £28; fine white crystals, £19 per ton, in casks, ex store. SALICATE continues nominal: home trade quoted at £3 5s. to £3 10s. per ton, in bulk, delivered. SODIUM ACETATE is moving in fair quantities and is steady at £18 5s. per ton, in casks, ex store. SODIUM CHLORATE remains dull at about 3d. and upwards per lb.; large quantities to come forward down to 2½d. per lb. SODIUM HYPOSULPHITE.—Dealers' prices are unchanged; business moderate: pea crystals, £15 2s. 6d. to £15 5s. per ton, in one-cwt. kegs; commercial quality, £9 5s. to £9 10s. per ton, in casks, ex store. British makers' price for pure crystals for home consumers on contract, £15 5s. per ton, carriage paid to buyer's station.

COAL-TAR PRODUCTS, etc.—Toluol and xylol are easier. Pyridine is weak, and pitch is again dearer and active for next season's business. Otherwise the market is unchanged and generally quiet. BETANAPHTHOL is in good demand and steady at 1s. 0½d. per lb., carriage paid. TOLUOL is easier: commercial 90s. 1s. 1½d.; pure, about 1s. 8½d. to 1s. 9d. gallon at works. XYLOL is much cheaper: pure, 2s. 2½d. to 2s. 4d.; commercial, from 1s. 8½d. gallon, naked at works. CARBOLIC ACID CRYSTALS keep steady, with a good inquiry from the East: quoted at 8d. per lb., f.o.b., in drums with over-casks. CRESYLIC ACID is in short supply, with the market very firm at 2s. 10d. per gallon, f.o.b., drums extra, for 97 to 99 per cent. American specification. NAPHTHALENE is unchanged: imported flakes and balls, £15 10s. per ton, in cases, ex wharf; British, about £14 per ton, ex works. Pure METHYL ALCOHOL is steady but quiet: one-ton lots, £46, in drums, ex store; cheaper for quantities to come forward. PYRIDINE is dull and easy as quoted at 7s. per gallon, f.o.b.: less for large quantities would be taken. PITCH.—Active and firm markets are reported, with the price for next season now up to 92s. 6d. per ton, f.o.b. East Coast.

Fixed Oils, etc.

PALM OILS are barely steady; linseed oil, after a slight decline, has rallied; turpentine is at slightly lower figures. ACID OILS continue dull and irregular on quotation: coconut or palm kernel, 32s. 3d.; groundnut, 32s.; soya, about 26s. 6d., spot. CASTOR.—Quotations are unchanged, with the market dull: pharmaceutical, 50s.; first pressings, 45s.; second pressings, 42s. spot. COCONUT.—Quoted prices are unchanged: deodorised, spot, 46s. 6d.; Ceylon, c.i.f., 39s.; Cochin, c.i.f., 48s. COTTON remains dull and easy: deodorised 45s.; common edible, 45s.; soapmaking, 42s. 9d.; crude, 35s. spot. GROUNDNUT: Deodorised, spot, 51s.; crude Oriental, c.i.f., 44s. PALM KERNEL: Deodorised, 51s.; crude, about 45s. spot. PALM is unsteady and easy: Lagos, 31s. 9d.; softs, 30s. 9d.; mediums, 31s. 3d.; hards, 32s. 6d.; bleached, about 34s. spot. RAPE: Refined, 47s.; crude, about 44s. SOYA continues dull and easy: deodorised, 45s.; crude, 36s. 6d., spot. LINSEED, raw, naked.—Forward positions are slightly easier on the week, and the market has been quiet: on spot, 32s.; August, 31s. 4½d.; September–December, 31s. 9d.; January–April, 32s. 1½d. Boiled oil, spot, 36s. 6d. Hull, on spot, 32s.; August, 32s.; September–December, 32s.; January–April, 32s. 4½d. TURPENTINE.—Prices have declined from the best prices seen lately, with spot delivery ranging upward of 42s. 6d. American advices are steady, but the home trade demand is restricted, and there is not much speculative support under the doubtful outlook. Deliveries for last week were 1,242 barrels, making a total since January 1 of 78,591 barrels, as compared with 69,943 barrels same date last year. Stocks were returned at 31,843 barrels, and adding to this landings and afloats the total London visible supply amounts to 39,919 barrels, against 19,003 barrels the same date last year. RESIN prices were irregular, while the finer pale grades were more firmly held. French resin is rather dearer and business is slow all round. C.i.f. terms for American for prompt shipment were as follows:—B to M 21s. 4½d., W.G. 23s. 6d., and W.W. 24s. 9d. Spot terms ex wharf command a premium of about 9d. per cwt. WOOD.—Hankow, in barrels, on spot is easier at 83s to 84s. per cwt.



Letters for this section should be written on one side of the paper only. Correspondents may adopt an assumed name for purposes of publication, but must in all cases furnish their real name and address to the Editor.

Insurance Payments for 1927

SIR,—The letters which have recently appeared *re* the above have mostly been written from a somewhat narrow view-point, and it would perhaps be helpful to present a more general survey of the matter. It is well to remember that the N.H.I. scheme introduced a new system into pharmacy, and when "the old order changeth yielding place to new" there is bound to be a period of disturbance and readaptation, which, owing to the war and its aftermath, has been unduly prolonged in this case; we are only just beginning to get at real grips with it. Experience shows that, if properly administered, an allowance of 2s. 10d. per head should provide for an adequate supply of drugs and a moderate remuneration to the dispenser; that remuneration is not as large as we may be justified in asking for, but forms a good basis to start with; and if after a fair trial it proves insufficient, then we should have a strong case for applying for more. Last year the actual cost per head in the N.-E. Midland district was 2s. 8½d. per head, and as this includes both industrial and rural areas, it is probably typical of the country as a whole; it should be remembered that the scheme is national, and the healthy areas will share with those in which more sickness prevails. We must not overlook the fact that administration of the fund is now in the hands of representatives of the pharmacists who have authority to institute inquiries into any apparently extravagant prescribing or other misuse of the fund. This, of course, is a delicate matter and needs handling in a right spirit. . . . Instances are not wanting in which patients consume in three or four days a supply of medicine that should last twice as long, and do so for a prolonged period; or, maybe, they are getting a supply for the family, which is equally an abuse of the fund. Every panel chemist should carefully note the instructions he has received from his Pharmaceutical Committee on how to proceed when reporting such cases as those indicated and others he may know that are an abuse of the fund; especially should he note the request to make no complaint himself, but report to his committee; the only sound basis for working is that there be mutual respect and goodwill between prescriber and dispenser, and this will be best maintained by working through the committee. These new conditions appear to me to afford reasonable grounds for hoping that after the first year we shall be as well remunerated as at present, and possibly better remunerated; for the next few months we must not be surprised at our accounts being heavily discounted.—Yours truly,

Nottingham.

WILLIAM GILL.

Excessive Panel Prescribing

SIR.—The list of drugs ordered for a panel customer quoted by "BM/VCLL" (*C. & D.*, August 6, p. 188) reads more like a wholesale order than a supply for a patient, and one wonders what proportion of these things he would have received if he had been a private patient of the doctor's or if he had had to pay for them over the counter himself. But in spite of the over-prescribing which we know goes on in respect of drugs, I think that it is in the dressings that the largest depreciation of the drug fund occurs. It is quite common for a workman who has sustained some small cut or abrasion in the course of his work to bring in a panel script calling for boric lint by the half-pound or pound packet, oiled silk by the half-yard, and half a dozen or so bandages; he cannot possibly use the whole supply. But the prescriber I can never fathom is the one who orders standard dressings by the half-dozen at a time to the same person.—Yours truly,

WONDERING (9/8).

Linseed, Liquorice and Chlorodyne Lozenges

SIR.—It is correct, as your correspondent "W. L. T." (*C. & D.*, July 16, p. 103) states, that the formulas for chlorodyne are published with and without morphine content, presumably for the benefit of unqualified vendors; this state of affairs is greatly to be regretted. But I would ask "W. L. T.," if he were obliged to seek the advice of a physician and received a prescription ordering chlorodyne, what he would expect to get; would he be satisfied that his prescription had been dispensed to the benefit of the patient if a chlorodyne were used containing no morphine? If in the course of business he had to dispense a similar prescription, would he dispense chlorodyne-sine morphina? I think not; the majority of dispensers translate "chlorodyne" as "tinct. chlorof. et morph., B.P. '85," and this is undoubtedly what many prescribers intend. Further, now that these things are becoming more standardised and if a preparation is not in the B.P. the B.P.C. is being taken as the standard, I think the non-poisonous variety stands a very poor chance of recognition.—Faithfully yours,

CHLOROMORPH (25/7).

Irish Preliminary Passes

SIR.—"Alma Mater" (*C. & D.*, July 23, p. 134) has entirely missed the point. Taking the matriculation list of Queen's University as a whole, there was approximately 25 per cent. of passes, but in the case of those candidates who entered with a view to becoming apprentices to pharmacy the proportion was less than 5 per cent. Taking into consideration that the examination was the same, but that in the case of pharmaceutical candidates their application papers were stamped by the Pharmaceutical Society, there is obvious reason for requiring an explanation, and who is better fitted to give that explanation than the chief executive officer of the University? There is profound dissatisfaction with regard to the matriculation examination of this University, but as the Pharmaceutical Council has decided to wait till September, further details will be reserved till that date.—Yours faithfully,

ONLOOKER (25/7).

Dispensing Notes and Difficulties

A Calcium Lactate Mixture

SIR.—I should be obliged if you would tell me the best way of dispensing the following mixture:—

Acid. lactic. ...	...	...	gr. cc.
Cretæ præcip. ...	...	...	gr. LXXV.
Aq. ...	...	...	ad 5j.

Yours truly,

T. P. B. (22/6).

[The mixture contains much more calcium lactate than the liquid will retain in solution. Seventy-five grains of precipitated chalk, when neutralised with lactic acid, produces about 225 grains of calcium lactate; that is the quantity prescribed for one fluid ounce of mixture, while twenty-five grains in a fluid ounce makes practically a saturated solution. It is well not to employ heat in preparing the lactate—just dilute the acid with water and stir in the precipitated chalk.]

A Nitroglycerin Mixture

SIR.—We should be obliged if you would let us have your opinion on the following:—

Liq. trinitrin. ...	...	...	mj.
Sodii bicarb. ...	...	...	gr. x.
Sodii salicyl. ...	...	...	gr. x.
Mist. quin. et gelsem. (L.I.P.) ad	...	...	5ss.

Yours faithfully,

E. G. H. (23/7).

[This prescription, when compounded, produces a nice mixture. Place the sodium bicarbonate and sodium salicylate in a mortar and rub together; then introduce gradually the quinine and gelsemium mixture, maintaining a steady trituration till all has been added; transfer to the bottle, and pour in the solution of trinitrin. There is a light, white, finely divided precipitate, which is easily shaken up, and remains suspended quite an appreciable time. No suspending agent or other addition is necessary. The completed mixture is very faintly acid.]

Legal Queries

A. M. (3/8).—What form of receipt should be used and what stamp is necessary when the deposit on the purchase of house property is paid? [The usual and proper course is to embody the receipt for the deposit in a contract of purchase which is signed over a 6d. stamp. We advise "A. M." to have a contract prepared by his solicitor.]

D. B. S. (2/8) is a qualified dispenser who earns £3 a week, living out, his hours being from 9 a.m. to noon, from 2 p.m. to 4 p.m., and from 6 p.m. to 8 p.m. each day. Is he liable to pay Unemployment Insurance contributions? [As he is apparently not employed at a rate of remuneration exceeding in value £250 a year he must be insured.]

Stock Valuation (9/8).—The value at which stock should be taken for purposes of profit for income-tax purposes is at the cash or market price, whichever is the lower at the date ending the account. If accounts, for example, are drawn up at June 30, stock would be valued at the prices ruling on this date. To value stock at the retail or selling price would obviously overstate and give a false profit, detrimental to the taxpayer.

Herald (2/8).—(a) Is a lease granted to a chemist's widow cancelled when she marries another chemist, and is a lease cancelled when the chemist to whom it is granted dies? (b) What is the usual fee in an arbitration when solicitors and accountants are engaged? (c) What form should a deed of gift take? [(a) The lease is not cancelled in either case. (b) There is no usual fee. The amount payable depends entirely upon the circumstances. (c) We cannot supply forms of documents. In any case, the form to be used depends upon the nature of the transaction. The deed may have to be registered as a bill of sale. A solicitor should be consulted.]

Dene (9/8) asks whether a chemist who is in business on his own account is entitled to pay contributions and so qualify for a pension at the age of sixty-five under the Pensions Insurance scheme. Would not the fact that the chemist is employed by the Ministry of Health as a dispenser under the National Insurance Acts bring him within the scope of insurance if his net income falls below the insurance limit? [The Pensions Insurance scheme applies only to persons serving under a contract of service, consequently a chemist in business on his own account does not come within it. A chemist is not employed by the Ministry of Health in the circumstances stated. He is in the position of an independent contractor.]

G. H. E. (5/8) holds his premises under a lease which provides that the landlord shall paint the outside woodwork in every third year of the term. Six years of the lease have now elapsed, but the landlord has not yet done the painting, although he has been repeatedly asked to do so. Part of the woodwork is now so rotten from want of painting that it will need to be replaced. What is "G. H. E.'s" remedy? [Strictly speaking, all that "G. H. E." can do is to sue his landlord for damages for breach of covenant. We doubt, however, whether the landlord would be held liable to replace woodwork that has decayed; but this depends upon the wording of the lease. An unorthodox remedy would be for "G. H. E." to have the painting done himself and to deduct the cost from the rent. Before doing this he should give notice requiring his landlord to do the work by a specified time. There is no legal justification for the latter remedy; but if "G. H. E." is sued for the rent deducted he can counterclaim the amount spent upon painting.]

Miscellaneous Inquiries

When samples are sent particulars should be supplied to us as to their origin, what they are, what they are used for and how. We do not undertake to analyse and report upon proprietary articles nor to publish supposed formulas for them.

A. C. (18/7).—(1) COLOURING FACE POWDERS.—The usual colouring materials for face powders are: *Cream* or *rachel*, yellow ochre; *brunette* and *naturelle*, burnt sienna and eosine (in varying proportions); *pink*, phloxine; *rose*, erythrosine or phloxine. (2) COLOURING BATH CRYSTALS.—For colouring bath crystals aniline dyes are

invariably used, as vegetable dyes are easily affected by alkalis and the colours become dull. A blue colour is produced by patent blue and yellow by fluorescein sodium. Green is a difficult colour to produce, being usually evanescent; the dye makers supply a green, but it is easily affected by light. Pink is produced by rosine or erythro-rosin and red by "neutral" red. The best way to fix the colours is to dissolve them in a 1 per cent. alcoholic solution of yellow resin and spray this solution on the crystals, making provision for rotating them at the same time. It is not only the alkali which is the cause of fading, but the paucity of the colouring and unequal distribution, so that the action of light is readily shown. It is owing to the difficulties mentioned above that some manufacturers pack the uncoloured crystals in coloured containers.

J. H. H. (1/7).—HEADACHE POWDERS.—The following formulas were published in the *C. & D. Diary*, 1925:—

Special Headache and Neuralgia Powder
P.F. 38

Ac. acetylsalicyl. ... gr. v.
Phenacetini ... gr. iv.
Caffeinae cit. ... gr. ij.

Headache and Neuralgia Powder
P.F. 37

Antifebrin. ... 3iij.
Sodii bicarb. ... 3j.
Carmini ... gr. x.

Divide into 4-gr. powders.
Directions: Place one on tongue dry and wash down with a little water. Repeat in four hours if necessary.

P. D. (26/7).—POT POURRI.—The following (No. 1) is from the *C. & D. Price List Formulary*:—

I
Lavender flowers lb. j.
Rose petals ... lb. j.
Orris root ... lb. j.
Table-salt ... 3viij.
Cloves ... 3iv.
Cinnamon ... 3iv.
Benzoin ... 3iv.
Pimento ... 3iv.
Vanilla ... 3iij.
Musk pod ... 3j.
Oil of lavender ... 3j.
Oil of sandalwood ... 3j.

II
Vanilla ... 3j.
Orris root ... 3j.
Cloves ... 3j.
Oil of lavender ... mx.
Oil of neroli ... mx.

III
Fill a 2-gallon jar with rose petals, orange blossoms and lavender flowers; sprinkle them with salt, and disperse through the contents 4 oz. of any pot pourri which does not contain the dried flowers. Oils of neroli and lavender may be used if the flowers are not obtainable.

F. C. (27/7).—BOOKS ON WATER-ANALYSIS.—See *C. & D. Diary*, 1927, 303.

Retrospect of Fifty Years Ago

Reprinted from
"The Chemist and Druggist," August 16, 1877.

New Chemical Theories

There was a halcyon period when we believed certain chemical facts devoutly. We accepted, for instance, the union of an acid and a base as a good theory, and thought that together they produced a salt. Hydrogen was a gas until it got occluded; and two names were about sufficient, the one to indicate the popular, the other the scientific appellation of a body. That was the age of diagram, not of equation. All those theories have vanished one by one: we have radicals acidulous and basylous, saturated and unsaturated atoms. We even tremble for the elements, which may enjoy their ephemeral existence, for Professor Atfield would feel no surprise if before any given quarter-day they resolved themselves into secondary compounds. What a glorious old atom that will be which will be able to survive the whole Chemical Society attacking its tough life. There is scarcely an acid retaining the formula bequeathed to us by Fownes or Gregory: to balance which we have acid salts which will not redden litmus, and balloons soaring in the air rendered specifically lighter by the weight of an added metal.



[Commenced C. & D., July 5, 1924]

Lime Salts.—See Calcium.

Lime Water, Storing.—The deficiency in lime which is frequently found in old samples of lime water is generally attributed to the absorption of carbon dioxide from the atmosphere, causing precipitation of lime as calcium carbonate. On account of the tendency to absorb carbon dioxide from the air, large stocks should be kept in glass containers which are closed with well-fitting corks, waxed and capped. In this case glass stoppers are not to be recommended, as these stoppers, owing to the formation of calcium carbonate deposited on them, become badly fitting. Stoneware vessels should not be used for storage, as the walls are not impervious to air. In the shop, where smaller quantities are handled, it is sometimes preferred to keep the lime water in contact with undissolved lime and to decant or siphon off the supernatant liquid when required. A siphon apparatus was described in the *C. & D.*, 1906, II, 231. Lime water can be kept in a glass-stoppered shop round, the stopper of which should be kept free from deposited calcium carbonate by frequent cleaning with hydrochloric acid, and the bottle should be kept filled. Lime water when so kept does not come in contact with a sufficient amount of air for the contained carbon dioxide to affect the strength of the solution to any great extent, nor can the action of the alkali on the silica in the glass have more than a slight effect on the lime content. The British Pharmacopœia recommends that lime water be made and kept in green glass bottles.

Limited Liability Company.—See Companies Registration; Company as Legal Person; Company Law.

Limited Partnerships.—A limited partnership is one that consists of one or more "general partners" who are liable in full for all the debts and obligations of the firm and also one or more "limited partners" who are liable only to the extent of such sum as they contribute to the partnership at the time of entering into it. A limited partnership must be registered under the Limited Partnership Act, 1907, otherwise it will be considered to be an ordinary partnership, and none of the partners will enjoy limited liability. In the case of a firm carrying on the business of banking the number of partners must not exceed ten, and in other cases twenty. A company may be a limited partner. A limited partner must not take part in the management of the business otherwise he will be liable in full for the debts and obligations of the firm incurred while he is taking part in the management. He is, however, entitled to inspect the books of the firm at any time, and to examine the state and prospects of the partnership business and may confer with the partners thereon. The death or bankruptcy of a limited partner does not dissolve the partnership; nor is his lunacy a ground for dissolution by the court unless his share cannot be realised in any other way. Subject to any special terms in the partnership agreement, any dispute as to ordinary matter connected with the business of a limited partnership is to be settled by a majority of the general partners, who may also introduce a new partner without the consent of the limited partners. A limited partner cannot dissolve the partnership by notice, nor can the general partners dissolve it on the ground that a limited partner has allowed his share to be charged for his separate debts. In other respects the ordinary law of partnership applies to a general limited partnership.

Limited, Use of Word by Companies.—The word "limited" is part of the name of a limited liability company, and must be used in every case where the

company's name is used. The penalty for the use of the word by a person or firm that is not incorporated is £5 for every day on which the title has been used. In the case of a company formed purely to promote commerce, art, science, religion, charity or any other useful object, when the whole of the company's income or profits are to be applied towards the object and none distributed by way of dividend to the members, the Board of Trade may grant a licence authorising registration without the addition to the title of the company of the word limited.

Linaloe Oil is the product of the Mexican linaloe wood, and possibly, to some extent, of the fruit. The trees principally employed for distillation are *Bursera Delpechiana* and *B. Aloexylon*, but other species are possibly used to some extent. It is a colourless or pale yellow oil, having a sweet odour, that of linalol, which is its principal constituent, and having the following characters:—Specific gravity, 0.875 to 0.898; optical rotation, -3° to -15° ; refractive index, 1.4590 to 1.4655. The principal constituent of the oil is linalol. This oil and oil of rosewood, known as "Cayenne linaloe oil," are the principal sources of linalol used for the manufacture of linalyl acetate. Linaloe oil is used in the perfumery of soap and in blending with other "soft" odours in many toilet perfumes.

Linalol is an open chain alcohol found in the free state in the essential oils of linaloe and rosewood. It is also found as esters as the main constituent of bergamot and lavender oils. It is isomeric with geraniol and nerol, and is of great importance in the manufacture of perfumes. Linalol is not easy to purify, as it yields practically no crystalline compounds. The purest specimens, obtained from the oils indicated, have the following properties:—

	Lavender oil	Bergamot oil	Linaloe oil	Lime oil
Boiling point ..	198°	198°	198.5°	198.5°
Specific gravity ..	0.8725	0.872	0.877	0.870
Refractive index ..	1.4640	1.4629	1.4630	1.4668
Optical rotation ..	$-10^{\circ}35'$	-16°	-2°	$-17^{\circ}37'$

According to Tiemann, a pure linalol may be prepared by heating the fraction of linaloe oil rich in linalol with metallic sodium under reduced pressure until no more sodium is dissolved. On cooling, the liquid is decanted from unchanged sodium and mixed with ether and phthalic anhydride. After standing a few days the mixture is shaken with water, which dissolves the linalyl-sodium phthalate, the uncharged linalol and terpenes remaining dissolved in the ether. The resultant linalyl phthalate is hydrolysed by alcoholic potash and the pure linalol is extracted with ether.

Linalol Esters consist of linalyl acetate, linalyl butyrate, linalyl formate and linalyl propionate. *Linalyl acetate* is the ester to which oil of bergamot almost entirely owes its odour. It is also found in lavender oils, petitgrain, ylang-ylang, neroli, jasmine and gardenia oils. It is prepared artificially by acetylating linalol obtained from linaloe oil, but it cannot be obtained pure in this way. It is colourless and has a strong bergamot odour, and the following are its properties: Specific gravity, 0.900 to 0.910; refractive index, 1.4500 to 1.4550; actual esters, 88 to 95 per cent. It is used in the preparation of artificial perfumes of the jasmine and other types. *Linalyl butyrate* is prepared by the esterification of linalol and butyric acid and is never quite pure. It resembles geranyl butyrate in odour and is used in floral perfume making. *Linalyl formate* is prepared in the same way as the acetic ester, and also is never fully esterified. It boils at 189° to 192° . *Linalyl propionate* is similarly prepared, and has a sweet bergamot odour akin to lily of the valley. It boils at 115° .

Linnæan System refers to the mode of classification of plants devised by the great Swedish botanist Linnæus and promulgated by him in his "Systema Naturæ" of 1735. This is an artificial method of arranging plants into classes according to the number of stamens present in each flower (as well as the relationships of the stamens to one another as regards adhesion of filaments, cohesion of anthers, separation of sexes, etc.). The system has

The C.&D. Commercial Compendium

been superseded by more natural methods of classification of plants based upon their evolutionary affinity, but the work of Linnæus laid the foundations for this more rational method by stimulating botanical comparisons.

Linnean Society.—The first meeting of the Linnean Society was held at the house of Sir James Edward Smith, F.R.S., a London physician, in 1788. Sir James Smith was elected president, and Mr. Thomas Marsham secretary. The Society started with thirty-six Fellows and several foreign members. The charter of the Society, dated March 26, 1802, provides that the Society shall consist of Fellows, honorary members, foreign members and associates, and that its affairs shall be administered by a president, treasurer, secretary and a council of fifteen elected from among the Fellows, five members of the council to retire annually. Minors cannot be admitted as Fellows. The 1802 list of Fellows included the names of William Allen (Plough Court, London), Edward Jenner, M.D., and James Sowerby. After Sir James Smith's death, which occurred in 1828, his library and collections were purchased by private subscription for £3,000, and were presented to the Society. The address of the Society is Burlington House, Piccadilly, London, W.1. General secretary, Dr. B. D. Jackson.

Linseed is the "Linum" of the British Pharmacopœia, and consists of the ripe seeds of the flax plant (*Linum usitatissimum*, Linn.). Linseed is a domestic remedy for coughs and bronchial affections used in the form of an infusion flavoured with liquorice juice, the mucilage of the seed coat being an excellent demulcent. The chief use of linseed in medicine is in poultice form (see Linseed Meal).

Linseed Cake is the residue remaining after expression of the oil from linseed (or flax seeds). It is a valuable adjunct for winter feeding of milch cows and for fattening oxen, though cheaper seed cakes (e.g., cotton cake) have to a great extent replaced its use for this purpose. Linseed cake is prepared by hot expression, and is less liable to cause cyanogenetic poisoning of cattle than solvent extracted linseed meals (q.v.).

Linseed, Commerce of.—Fluctuations in the world's commerce of linseed have, apart from absorbing capacity or industrial conditions, become more and more determined by the phenomenal growth of resources from the Argentine, where the area under linseed cultivation in 1925 was enlarged to a point indicating about one-third of the total world's, which was approximately 18½ million acres. The increase in the world's area compared with the average for 1909-13 represented well over three million acres, which resulted, according to the returns compiled by the International Institute of Agriculture, in the total world's production being raised from 60,701,000 centals (average for 1909-13) to 89,739,000 centals for 1925, or an increase of 48 per cent. Based on the index number given for 1909-13 of 100, there was only a slight increase in 1920 in production to 103 per cent., from which a slump ensued in 1921 to only 69 per cent. This was the most critical year for the crushing industry, when the total world's output declined to 41,615,000 centals, while the proportion produced in the three chief exporting countries (Argentine, India and Canada) amounted to 28,537,000 centals. The exports from these countries combined in that year even exceeded that amount, thus emphasising the dearth of supplies at crushing centres and consequent severe inflation in value either for seed or the oil product. Since 1921 there has been a steady increase in cultivation, while in 1925 the United States and the Soviet Union almost completely recovered the ground lost during the war period in the matter of area, although, on the other hand, Europe, Canada, and especially India, fell below the 1909-13 average. The most striking increase, however, was in the Argentine, where the 1925 crop eclipsed all previous high records, having been estimated at fully 1,900,000 tons. By that country's contribution to the total world's production, which for the 1909-13 period amounted to 28.7 per cent., was raised for 1925 to as much as 46.7 per cent., compared with a little less in

the five-year period 1920-24. With Argentina placed in a position to export out of her crop during 1926 roughly 600,000 tons more than in the previous year, her formidable competition was the main factor in cheapening the cost of linseed and linseed oil more in line with pre-war levels. The price of Argentine seed, indeed, was brought down in the neighbourhood of £13 a ton in the early months of 1926, comparing with as much as £22 a year previous. The result of the 1925 Argentine crop as given above, when actually confirmed, proved quite a revelation to the world's markets. Under the enormous accession of supplies from the River Plate based on the new high record crop, the total world's shipments for 1926 promise to exceed all previous returns, as at the considerably lower price the Continental and home takings, as well as the shipments from Argentine direct to the United States, have assumed a great deal more elasticity. Cheap linseed oil, of course, means that its outlet is apt to be greatly stimulated for the usual purposes; moreover, Continental manufacturers have been induced to revert to the use of linseed oil by a hardening process for the manufacture of soap. While the superabundance of linseed resources in one season is always apt to be corrected in another if not the next season, the bulk of the supplies should be fairly well absorbed by the continuation of low prices. These may lead to certain restrictions on future sowings if the cultivation of other crops affords more attraction to farmers in point of value. Imports into this country in 1925 were abnormally small at 340,955 tons from all sources, compared with 445,101 tons for 1924 and 381,506 tons for 1923. This was due to high prices and very keen American competition for Argentine supplies, which had become a matter of concern to home crushers, while the Indian production has not varied a great deal in more recent years at generally under 400,000 tons. A satisfactory feature is that cultivation in Russia has been fairly well restored, and that considerably larger quantities have already been accounted for from that country during 1925. Before the war the shipments from Russia were also important, and will now probably continue to increase, although the larger portion of the crop is still needed to meet domestic requirements of a rather urgent character. The yield of the United States crop in 1925 was about 5½ million centals less than for the previous year, so that that country has been the more dependent on importations from the Argentine. The figures compiled by the International Institute of Agriculture, giving the linseed production and exports of Argentina, India and Canada (in thousand centals), are as follows:—

Linseed Production and Exports of Argentina, India and Canada

(In thousand centals)

Years	Production of the year mentioned (*)	Exports during the year following on that mentioned	Percentage of exports compared with production
1909	23,706	22,895	96.6
1910	25,078	21,442	85.5
1911	31,059	23,859	76.8
1912	53,991	43,491	80.6
1913	42,644	30,885	72.4
1914	37,893	26,786	70.7
1915	32,051	25,523	79.6
1916	17,544	10,485	59.8
1917	26,076	14,764	56.6
1918	32,159	26,989	83.9
1919	36,268	28,665	79.0
1920	47,468	34,364	72.4
1921	28,537	28,667	100.5
1922	39,214	32,906	83.9
1923	48,418	41,365	85.4
1924	40,828	33,982	83.2
1925	59,223	—	—

(*) The yields in Argentina and in India are those secured about the end of the year mentioned and the beginning of the following year.

It will be seen that in the course of the long period covered by these figures very sharp variations were experienced, and that the new "record" for 1925 exceeded to a large extent the exceptionally high returns for 1912.

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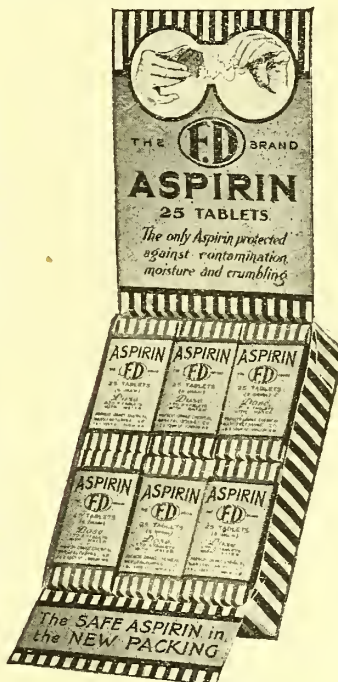
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6 doz. pks. of 12 ASPIRINS	@ 15/-	0	7	6
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Does not come under D.D.Acts, and can be prescribed without trouble. Rapid action.

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TRUE HONEY FLAVOUR**

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**NEW ZEALAND
'Imperial Bee' Honey**It has the largest sale in the world and repeat
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48/1's	Glass Screw-top Jars	at	14/-
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A & PS

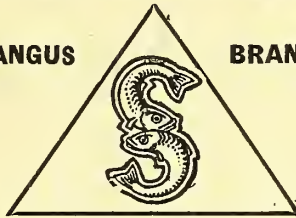
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CONSTANT HIGH VITAMINE CONTENT

(the result of the latest improvements in Cod Liver Oil refining).

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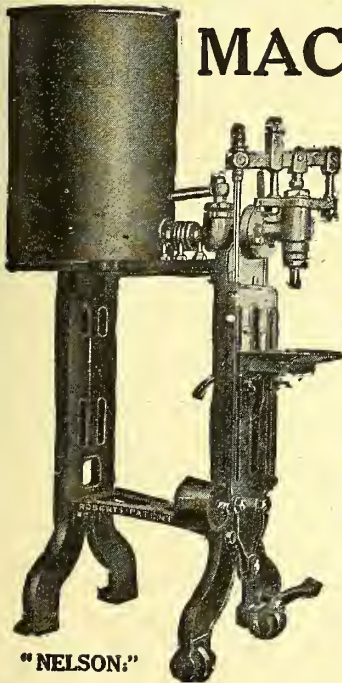
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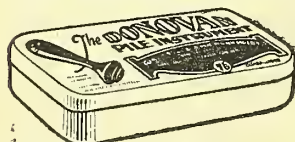
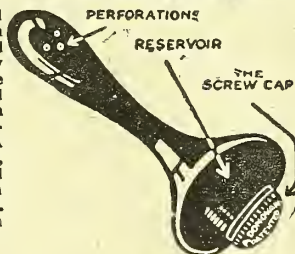
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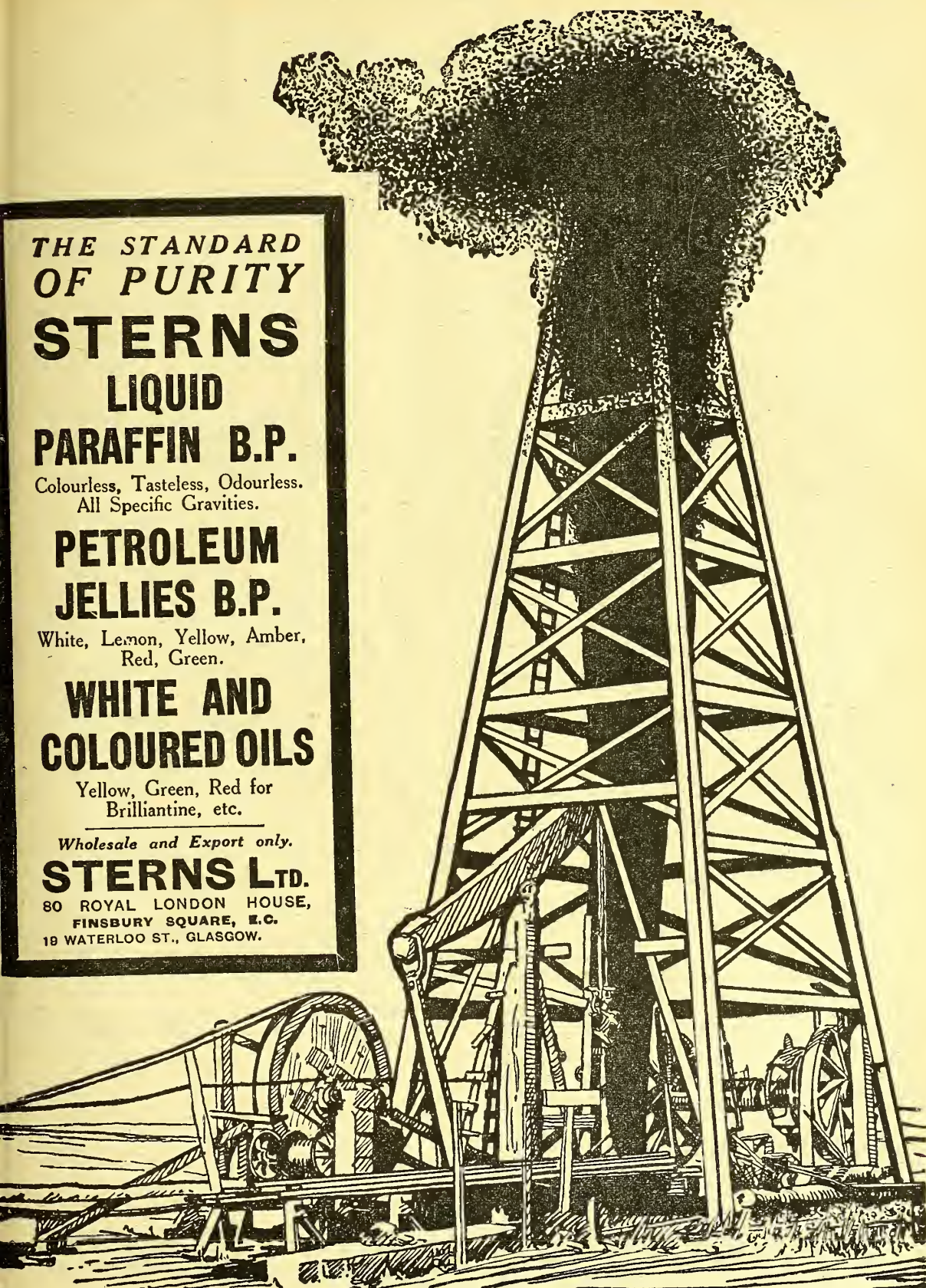
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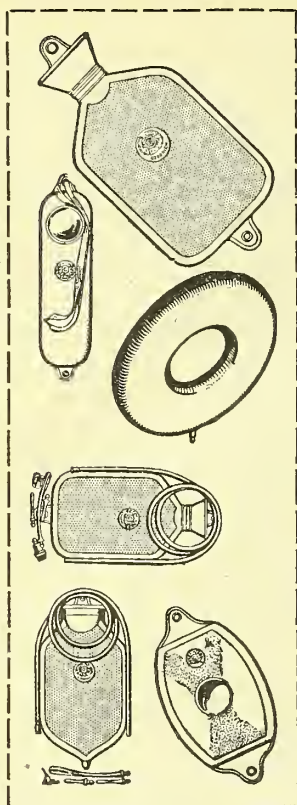
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HOT WATER BOTTLES

BRITISH GOODRICH

WHOLESALE DISTRIBUTORS:

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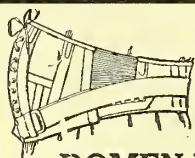
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“DOMEN” BELTS
SINGLE BELT SUPPLIED.

All sizes in stock ready for delivery per return. List and Terms on application. Catalogues supplied free for distribution.

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The most convenient and secure Pill Box obtainable.

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Sal Alembroth	2/- 1/2 -/8	18/- 10/6 6/-
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Carbolic		
Boric		

Plain Absorbent
Double Cyanide
Picric
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	Minimum Public Prices Each	Minimum Trade Prices Per Doz.
6-yd. 3-yd. 1-yd.	6-yd. 3-yd. 1-yd.	6-yd. 3-yd. 1-yd.
1/7½ 1/- -/7	14/8 9/- 5/4	
2/2 1/3 -/8½	19/6 11/3 6/4½	
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2in. wide	1/2 each	10/6 doz.
4 "	1 8 "	15/- "
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Approx. 6 yds. Plain and 4 yds. Boric		

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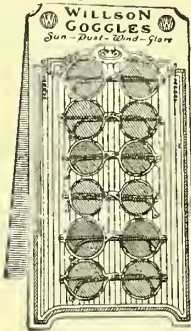
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For SUN, DUST, WIND & GLARE



Assortment
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"Two-way"
Display Card
showing Six
Goggles on
each side.
Stock is
assorted
crystal and
mottled shell
colour with
the popular
"COMFORT"
ear bows.

Each Goggle in a Vest Pocket
Leather Case.



STYLE K.7.

Coloured Goggles, Mottled, Shell Colour
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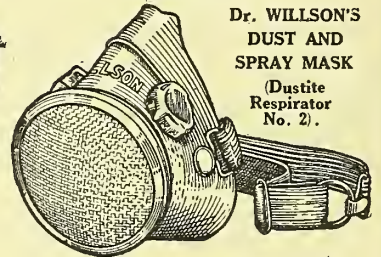
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Also any information gladly
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Look for
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on the frame

FOR DUSTY WORK AND
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Dr. WILLSON'S
DUST AND
SPRAY MASK
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Respirator
No. 2).

Dry Filter Model with 2 relief valves.

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Wet sponge Filter Model with 2 relief valves.

Protection with comfortable breathing.

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All first-class selling lines.

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A VERY EFFECTIVE
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SPECIAL DESIGNS
SUBMITTED.

SQUEAKERS,
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WE ARE ACTUAL MANUFACTURERS

JOSEPH HARRIS & COMPANY
RUBBER WORKS, BROADHEATH, ALTRINCHAM.

VULPRO lines in season this month!

These four "Vulpro" lines are just the thing to sell in the holiday season. Our showcards help you to display them in your shop and get your share of the profitable "Vulpro" trade.

VULPRO SPONGE BAGS.

Vulpro sponge bags are packed in a handsome display box with a cellophane lid to show their brilliant colourings and pretty designs. They are made in three sizes. Vulpro sponge bags will not peel or crack; they are odourless and absolutely waterproof. Display box containing 24 sponge bags, assorted sizes and designs, costs you 25/-.

Vulpro Tourist Case.

Made in strong proofed sateen in gay colourings and designs, these little cases contain soap, face cloth and towel, and are invaluable to travellers. They retail at 2/11 each.

Vulpro Pic-nic Squares.

Squares of strong waterproofed material that pack neatly into a tiny satchel. Indispensable for pic-nics or any outdoor occasion when the ground is damp to sit upon. Retail price 1/6 each, including satchel. Display card with each dozen.

Vulpro All-purpose Straps.

Neatly carded and retailing at 5d. each, these straps are of tough, elastic "Vulpro" rubber with a strong hook and eye fastening. They have literally hundreds of uses.

Sole Export Agents for Africa, Asia, Australia, New Zealand, S. America & British West Indies—
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LINE
WORTH
RECOMMENDING

BACKED BY A
REPUTATION
of 50 years

Chemists can offer
**Rendell's Soluble Quinine
Pessaries**
with complete confidence

The Public know Rendell's
Pessaries, it is a line
tested and proved in
all parts of the world.

*Every Genuine
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W.J. Rendell's
Autograph Trade
Mark.*

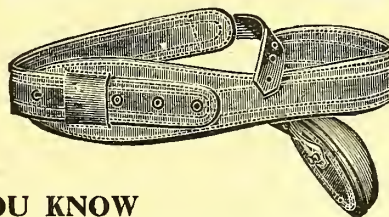
W. J. Rendell
Inventor and
Sole Maker
LONDON



The "Hernicura" "COMFORTABLE"

Reg. No. 627925.

Patent No. 23241.



YOU KNOW

how often you have trouble in fitting customers with trusses, and how frequently dissatisfaction is expressed.

TRY

the "Hernicura" Trusses. They are easy to fit, possess great adaptability, give absolute satisfaction, and yet are most reasonable in price.

A 33-inch Truss will adjust from 30 to 36 inches.
Head is also adjustable.

Write for Price List.

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SPECIALISTS

IN
HIGH CLASS BOTTLES
FOR THE
PERFUMERY AND ALLIED TRADES.

All our products are made on the premises.

**BOTTLES MADE FROM BEST
WHITE FLINT BATCH GLASS ONLY**

Any shade of Green Glass also supplied.

We are the Largest Manufacturers of Stoppered Perfumery Bottles in Great Britain.

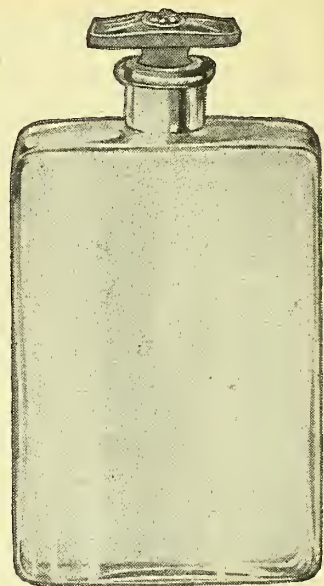
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BELLCHAMBERS GLASS BOTTLE CO., LTD.

EST. 1850.

HIGHBURY, LONDON, N.5.

EST. 1850.



GLASS BOTTLE CONTRACTS.

We can quote SPECIAL PRICES for Contracts
for REGULAR DELIVERIES of

GLASS BOTTLES & JARS

of every description.

MOULDS FREE for LETTERED and SPECIAL LINES.

Send us your enquiries now for WINTER and CHRISTMAS
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Write or 'phone (Central 2430, 5 lines).

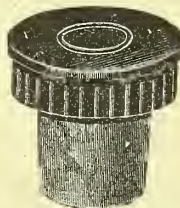
L. LEPERSONNE & CO.

(Estab. 1888.)

99 CANNON STREET - LONDON, E.C.4

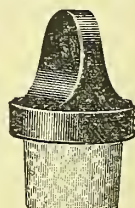
(Strictly Wholesale. Original crates only.)

STOPPERS



200 Varieties
Any Colour.

A suitable Composition Stopper will enhance the selling value of your package. Let us fit your Bottles and quote you.



T. WEBSTER & Co. Telephone: Mountview 0952
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WAGNER'S DRY BOTTLE CAPS

BEST IN QUALITY & APPEARANCE



Self-Fixing

R.V. WAGNER

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Sent on 14 days approval

Upon receipt of Cash or two wholesale trade references.

The "Little Brilliant" Till.

Well seasoned highly polished solid mahogany, dovetailed edges, Alarm Bell, Lock and key to lid. Size 16x8 1/2 x 3 1/2. Paper Coils 2 1/2 in. wide, 4/6 doz.

List No. CD932 of other Tills free.

The "Argyle" Till.

Highly polished solid mahogany, dovetailed edges, check action to drawer, Alarm Bell, Lock and key to lid. Size 18x9x7 1/2. Paper Coils 3 1/2 in. wide, 4/6 doz.

DUDLEY & COMPANY, LIMITED.
HOLLIDAY ROAD, LONDON, N.7
City Showrooms: 65 Fore St., E.C.2

Registered Trade



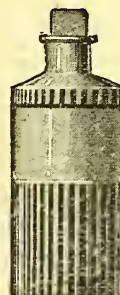
Mark, No. 26866.



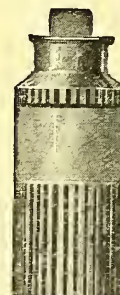
Hand-turned Shop Rounds.



Recessed Shop Rounds.

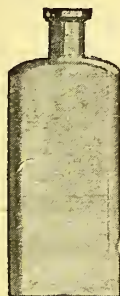


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SHOP BOTTLES

of the finest finish. Perfect Stoppering. Made in glass free from arsenic and lead; this feature is of vital importance in the case of Shop Bottles.



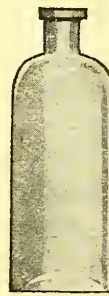
R.C. Flat.



B.C. Flat.

DISPENSING BOTTLES—

accurate in Capacity,
free from arsenic and
lead, and handsome
in appearance. The
aristocrats of bottles.



Oval.



Oval Fronted Flat.



B.C. Square.



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DOUBLE-ENDED FEEDERS

The finest the world has yet seen.
Made in beautiful lustrous white
flint glass which is so durable that
it may be boiled continuously for
twenty-four hours without shewing
signs of deterioration.



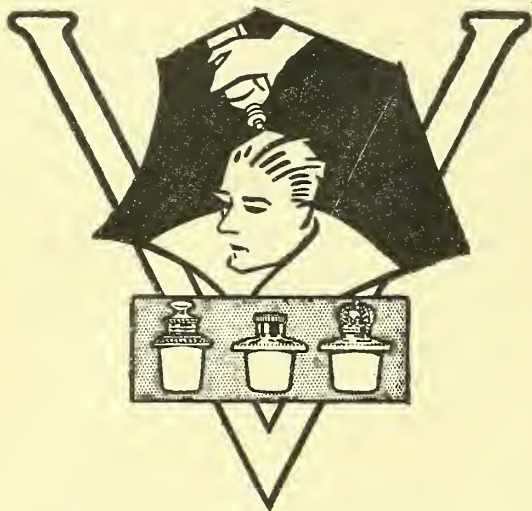
Oval, 2 Flat Sides.



Octagon.

Sold by all the Leading Wholesale Houses.

WOOD BROTHERS GLASS CO., LTD.
BARNSELY, (Established 1828) **ENGLAND**



Trustworthiness

Venesta Sprinkler Stoppers retain their newness long after they have passed from the wholesale warehouse and retail shop counters.

They are strongly made and have a well cut thread which will wear well and will save the ultimate purchaser irritation and annoyance.

Make a note of these facts. Get good looking, economical, efficient stoppers made by Venesta.

VENESTA METAL TUBES

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Drummer Dyes are a popular purchase during the summer months. Light frocks need dyeing to keep them fresh, and what other dye is held in such high esteem?

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Drummer Dyes

Trade Terms and full range of attractive advertising matter sent free on receipt of postcard to
EDGE'S, BOLTON

28 SAFE
& SIMPLE
COLOURS
to Retail at
4d.

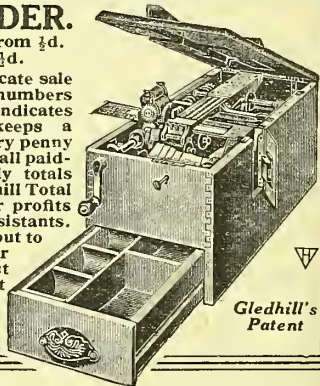
GLEDHILL'S

TOTAL ADDER.

Registers any sales from 1d. to £19 19s. 11½d.

Prints a receipt, duplicate sale strip, consecutively numbers every transaction, indicates assistant's initial, keeps a thorough check on every penny received, accounts for all paid-outs and automatically totals all receipts. The Gledhill Total Adder safeguards your profits and protects your assistants. British made throughout to last a lifetime. Send for Catalogue giving fullest particulars, instalment plan, etc.

G. H. Gledhill & Sons Ltd.
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Gledhill's
Patent

Chemists' Fittings

When you want Shop Fittings it will pay you to send to

GEORGE COOK

The Chemists' Working Shopfitter.

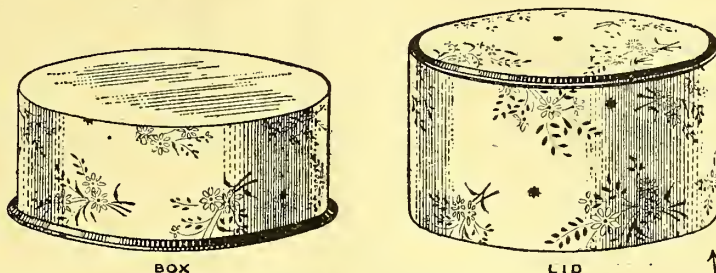
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30 years' experience

Rough Sketches free.

BOXES THE BEST BUYERS BUY



No. 1.

Illustrated above is one of our new Face Powder Boxes, which are very pleasing and attractive. When filled these Boxes are absolutely powder tight and remain so until the parchment drum has been punctured by the purchaser. Samples and Prices gladly sent on request.

NOTE ITS GOOD POINTS

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| 1 | Flanged bottom which enables lid to be taken off easily. | 1 |
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| 3 | Transparent or Parchment Drum, making the Box powder tight. | 3 |
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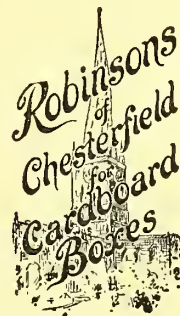
Wheatbridge Mills.
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Robinson & Sons, Ltd.

*Manufacturers of Round, Oval, Square
and Folding Cardboard Boxes,*

Chesterfield & London



Telegraphic Address :
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With the season's orders we are supplying the attractive cut-out illustrated. The very realistic effect obtained by our artist is a powerful inducement to any woman to purchase.



We offer the following varieties, each made from a fine Cocoanut Oil Soap base and suitably perfumed:—


Bay Rum and Cantharides.
Chamomile.
Cocoanut Oil.
Lavender, Camphor and
Rosemary, etc.

per **17/6** gross

□ □ □ □

Egyptian Henna
Imparts a beautiful "glint."

per **20/-** gross

 Note the new Showcard.

Three distinct styles for all.

Why not run this series of shampoos which can carry YOUR name and address?

ARTHUR H. COX & CO. LTD
Manufacturing Chemists
BRIGHTON ENGLAND

Where Quality & Price Go Hand in Hand

Our policy and aim has always been—*quality first* ; then, and then only, *price*.

We have never manufactured down to a price and never shall, but the ever-increasing demand for our products enables us to manufacture economically, with the result that our prices are, to say the least, worth knowing.

Now as to our Manufacturing—It is worth putting on record that we apply searching tests for *purity* and *strength* to all our products.

Close attention to these important points, coupled with modern methods in manufacture, ensure the unvarying high standard of our pharmaceutical preparations.

|| WE MAKE FULL USE OF THE PHARMACEUTICAL
SOCIETY'S BIOLOGICAL LABORATORIES FOR
PREPARATIONS OF ERGOT, SQUILL, DIGITALIS
AND STROPHANTHUS. ||

HOUGH, HOSEASON & CO., LTD.
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THE BRITISH DRUG HOUSES

RADIOSTOL

Vitamin D—Antirachitic.

The vitamin produced by sunshine, manufactured by the irradiation with ultra-violet rays of ergosterol (Provitamin D)

RADIOSTOLEUM

Vitamin A and Vitamin D in solution.

A palatable vegetable oil superseding cod-liver oil. Radiomulsin is an emulsion of Radiostoleum. It corresponds with and supersedes cod-liver oil emulsion. The principal use for Radiostoleum, however, is for incorporation in

B.D.H. MALT EXTRACT

Vitamin B.—Appetite-producing and antineuritic.

Made by an up-to-date vacuum process by which the diastatic and digestive properties of the finest home-grown malted barley are preserved.



RADIO-MALT

THE COMPLETE VITAMIN FOOD.

This unique combination possesses within itself the qualities of all three vitamins. It supersedes, therefore, extract of malt and cod-liver oil, to which it is in every way superior.

The rapid rise of Radio-Malt to popularity is due to its supreme merit and to the co-operation of the pharmacist in making it known to his customers.

During the coming winter we intend that Radio-Malt shall become a household word, and we solicit your continued co-operation towards this end.

Radio-Malt brings not only a good profit but also prestige, as is evidenced by the following letter written by a pharmacist customer, who was persuaded to take a small quantity of Radio-Malt into stock, when ordering a larger quantity:

"Radio-Malt is a 'knock-out' here, and you should see some of the cases of children who have been put on it. The doctor here has been paying me a tribute about it, and cannot believe the results, it has had such a wonderful effect."

If you will keep well stocked with Radio-Malt and display it prominently in your pharmacy, you will enjoy a similar experience.

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